# COMPUTERWORLD

### INSIDE

In Depth — Move over, Unix: Here comes Mach! Page 97.

Executive Report — Wall Street tries to shed weight while building muscle. Page 75.

Secret Service crackdown scoops up thousands of computer disks, but details on scope of hacker case remain

sealed as nationwide investigation continues. Page 128.

Novell, Banyan take different tacks to position their products against Microsoft's LAN Manager. Page 10.

Doesn't make the grade:

IBM offers low-end 286based PS/2 to education market, but academic computer managers say system won't gain admittance. Page 128.

PC-size VAX? DEC official responds to user queries at DECUS with hints of upcoming systems. Page 8.

Who was endorsing whom when IBM and DEC showed up at Computer Associates' coming-out party for CA '90s? Page 25.

AT&T lowers entry cost of its graphical workstationbased network management system. Page 129.

Don't look back is the theme at Epoch Systems, which has gone through a boom year in its storage market niche. Page 103.

### Windows pulls Lotus into corner

Multiple 1-2-3 choices could confuse market

BY PATRICIA KEEFE CW STAFF

BOSTON — Bowing to user pressure and the anticipated impact of Windows 3.0, Lotus Development Corp. surprised no one last week when it said it will port its 1-2-3 spreadsheet to Microsoft Corp.'s Windows environment, probably in 1991.

Also driving that decision is the fact that "the pace of OS/2 maturing hasn't been sufficient," acknowledged Frank Ingari, vice-president and general

### The 3 faces of Lotus The firm will sell multiple high-end versions of 1-2-3

- Release 3.0, currently the high end of Lotus' DOS spreadsheet family, will be supplanted in September by Release 3.1
- ▶3.1 will run native under DOS, in character mode under OS/2, and in full screen mode under Windows
- ▶ '1-2-3/W' should ship sometime in 1991 as a full-function Windows application
- ▶ 1-2-3/G, implementing the full OS/2 Presentation Manager, shipped in March

manager of Lotus' PC Software Division. The spreadsheet mak er first hinted three weeks ago that it might "reassess" its strategy regarding Windows [CW, April 23].

Lotus will nonetheless continue to promote OS/2 — which it expects will run neck and neck with Windows in personal computer shipment sales by 1992 as the better environment, Ingari said.

Continued on page 8

### Officevision birthday blahs

BY ROSEMARY HAMILTON CW STAFF

Where there is smoke, there is not necessarily fire — or so IBM's Officevision story shows.

One year after the hot debut of its first Systems Application Architecture application, this integrated set of office tools seems stuck in evaluation mode at many user sites instead of becoming a real piece of their information systems structures.

While some users have adopted the initial capabilities of Officevision in Release 1.0 (see story page 129), others remain unconvinced that there is anything

"I have yet to find one single feature [in Officevision] that we haven't had for years," said George Sekely, vice-president of computers and communications at Canadian Pacific Co. "When you remove the surface, it's just VM and Profs. This is 1990s wallpaper on peeling 1970s plaster."

#### Still smoldering

Most industry observers did not expect Officevision to quickly set the market ablaze, because IBM has positioned it as a long-term strategic product. IBM prefers to focus on the long-term objectives and considers Officevision's first year a success in that it was established and met its delivery deadline for Release 1.0.

The purpose of Officevision is twofold. First, Officevision is designed to provide an integrated set of traditional office tools, such as electronic mail, that are intended to be consistent across the four SAA platforms.

Second, it is meant to serve as the central point at which an end user can access applications. move data among them and use that information with a host of office tools.

> "Why would someone buy a Continued on page 129

### Focus turns to consumer rights

At Issue: PRIVACY

BY MITCH BETTS CW STAFF

After several years on the back burner, the privacy issue is heating up as the public, consumer advocates and legislators grow concerned about businesses compiling databases on consumer financial transactions and life-

During the next five weeks,

three congressional hearings, a Lou Harris Associates opinion poll and a conference hosted by

the National Consumers League. Furthermore, a U.S. House of Representatives panel is preparing to write legislation beefing up the privacy protections

in the Fair Credit Reporting Act

"It's probably one of the critical issues of the '90s. Actually, we've already lost the war on privacy. Now the question is how

privacy will be the subject of to begin to reclaim some of the lost ground," said Steven W. Hamm, administrator of the South Carolina Department of Consumer Affairs.

"The ability to combine several different databases of relatively innocuous information into a detailed profile of

an individual consumer poses a very real threat to consumer privacy," said Bonnie Guiton, who is director of the U.S. Office of Consumer Affairs and the consumer advisor to

Continued on page 127

### Leasing abuses charged

Industry cleanup exec cites 'immoral' practices

BY NELL MARGOLIS

ORLANDO, Fla. — The man who has been called upon to clean up the computer leasing industry's most spectacular failures is warning industry executives that too many of them may be conducting business on the shady side of the law.

Without naming any names, James P. Hassett took the podium at the semiannual meeting of the Computer Dealers and Lessors Association earlier this month and said that some companies are engaged in abuses that are "surely immoral" and, in some cases, of dubious legality. Hassett, as a court-appointed trustee, has now overseen the reorganization of four fallen leasing companies, including the fraud-ridden O.P.M. Leasing Services, Inc.

Hassett cited questionable practices, including the selling of computers without benefit of holding legal title and the stripping of systems to sell or lease their parts without properly accounting for the transaction.

Hassett's warning came at an opportune time. Even as he gave his address earlier this month, the fate of New York-based Atlantic Computer Systems, Inc. — a \$195 million leasing firm widely thought to be in sound fiscal shape — hung in the balance as its UK-based parent company careened from its place as the

Continued on page 6

### Aftermath



Robert T. Morris remained tight-lipped after his sentencing for Internet worm conviction, as others debated adequacy of sanctions. Page 128.

### IN THIS ISSUE

### **NEWS**

- **4** An Index Group survey outlines an exercise in frustration for systems developers.
- **4** More huffing and puffing from the Unix front, this time over distributed computing platforms.
- **6** NCR moves into the high-speed lane with the introduction of 486-based boxes
- **6** Frito-Lay takes to the skies with plans for a satellite network
- **10** Novell's Netware enhancements should clear up access for SQL servers.
- **10** Banyan's Vines will twine together with Microsoft's LAN Manager.
- **14** Banks could be a strong factor in towing EDI into the business mainstream.
- **128** Morris sentence provokes debate over whether the punishment fits the crime.
- **128** Big hack attack: Nationwide raids attempt to break up a computer crime ring.
- **129** Officevision technology is taking a back seat to SAA applications.

### Quotable

"W hen you remove the surface, it's just VM and Profs. This is 1990s wallpaper on peeling 1970s plaster."

GEORGE SEKELY CANADIAN PACIFIC CO.

On IBM's Officevision. See story page 1.

### SYSTEMS & SOFTWARE

- **25** IBM and DEC drum up a strong show of support for CA '90s.
- **29** Boston's WGBH raises money the new-fashioned way they use high-tech.

### PCs & WORKSTATIONS

**39** IBM refuses to be blue about the gloom and doom surrounding OS/2.

### **NETWORKING**

**59** Unisys hopes to Connect some customers with a new LAN service program.

### MANAGER'S JOURNAL

**67** IS is in the vanguard of the brigade that wants a home to be an office, too.

### **COMPUTER INDUSTRY**

**87** Two up-and-comers — Network General and Epoch Systems — are delight of industry eyes.

#### **EXECUTIVE REPORT**

**75** The financial services industry looks to IS for support in a time of transition.

### IN DEPTH

**97** Surprise! The winner of the Unix wars may not be Unix at all. By Gary H. Anthes.

### **DEPARTMENTS**

- 8, 127 News Shorts
- 18 Advanced Technology
- 22 Editorial
- 73 Calendar
- 108 Computer Careers
- 119 Marketplace
- 124 Training
- 126 Stocks
- 130 Trends

s it any surprise that 29 of the top 100 — as well as six of the top 10 companies on Business Week's "Best Small Companies" list this year are in the computer field? The list includes hot young upstarts, such as Tseng Laboratories and Cabletron Systems, as well as such old favorites as BGS Systems and Goal Systems International. Best niche strategy has to belong to Electronic Data Technologies, a maker of video gambling systems. And the fact that Rainbow Technologies lands at number 30 on the list makes a bittersweet statement about the industry. Rainbow sells systems and software that prevent software piracy.



search laboratory sponsored by Andersen

Consulting. Page 18.

Steve Murek/Blacksta

With inspirational Louvre architecture as a backdrop, PC manager Alain Vignon envisions a PC networking architecture for Paris-based construction firm Dumez Group. Page 43.

### EXECUTIVE BRIEFING

- Clean up your act, computer leasing industry executives were told at their biannual conference. James Hassett, the trustee for the bankruptcies of O.P.M., Itel and now CIS, chided CDLA members for creative accounting practices that are immoral, if not illegal. Page 1. To avoid the financial risks of less-than-honest lessors, IS directors who lease computers should look beyond low rates and beware of a deal that is too good to be true it probably is. Page 6.
- and brokerage firms are in a quandary, caught between a cost drought and expanding needs for new systems. Some are counting heavily on downsizing to alleviate the resource crunch, and many are requiring that all new project requests pass through review boards. A big challenge for all financial services firms will be devising new strategies to replace outdated products and valued-added services that computer-equipped customers can now perform for themselves. Page 75.
- Systems development directors are frustrated by a lack of real user commitment to development partnerships and lingering perceptions of their staffs as too techie. An Index Group survey also revealed that the use of CASE tools is mainly experimental, and CASE is not a panacea for faster and better development. Page 4.
- Database marketing and the increased value of information are raising a slew of new issues regarding consumer privacy. Federal and state legislators are gearing up to scrutinize many private-sector business practices, ranging from phone number identification to mailing list referrals. See stories pages 1, 127.
- Banks have the potential to be key players in EDI, but laggards risk falling far behind the leaders. Some banks have already emerged as "EDI matchmakers" to compete with such vendors as GEIS. Page 14.
- Frito-Lay looked to the sky and will install a satellite network from Scientific-Atlanta. The planned nationwide network of 300 VSATs will support Frito-Lay's large executive information system, which had the potential to overload the firm's land-based network. Page 6.
- One year later, where is IBM Officevision? Many users say IBM's first SAA application is far from being the breakthrough integrated of-

fice package first promised. Lack of support for Unix and multivendor environments, as well as the delay of Release 2.0, are big problems. Page 1. Meanwhile, some IBM software partners are also frustrated and proceeding with their own SAA applications. Page 129.

- better to telecommuting than other functions do, and many IS departments are forging ahead with programs that allow employees to work from their homes. But observers say telecommuting will not take off until sophisticated groupware packages and more powerful PCs become more commonplace. Page 67.
- On-site this week: Boston's public television station, WGBH, powers its fund-raising drives with a DEC VAX 8550. The CPU tracks 1.5 million donor records and contributions that totaled more than \$15 million last year. Page 29. To help determine the creditworthiness of some 200,000 retailers, Dun & Bradstreet calls on an expert system. Based on a shell from Inference Corp., the 1-year-old system is the first expert system at D&B's Credit Clearing House in Murray Hill, N.J. Page 30. France's second-largest construction firm has built a large Compag network. The Parisbased Dumez Group recently invested in two Compaq Systempros as servers for some of its networks of 250 PCs. Page 43.

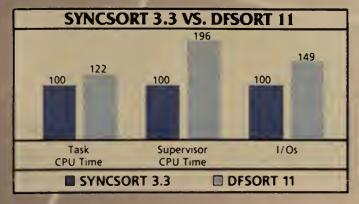
# WHEN THE FORTUNE 500 WANT SORTING EFFICIENCY, THEY DON'T WASTE TIME.



### THEY CALL SYNCSORT.

Sorting time can be a costly drain on resources. Which is why most Fortune 500 companies use Syncsort to optimize sorting.

For the most efficient and effective sorting, Syncsort offers a complete solution of software, training courses and performance enhancement services. We act as your partner by evaluating your



unique sorting needs and providing a tailored solution of software and services. Our professional services are unconditionally guaranteed. With Syncsort as your sorting partner, you can double your sorting efficiency.

No wonder most Fortune 500 companies have relied on us for over 20 years. They've seen us consistently outperform the competition, making us the leading sort company. They consider Syncsort to be an investment that pays for itself hundreds of times over.

For sorting efficiency, don't waste time. Call your sorting partner: Syncsort.





800-535-3355

### Systems developers frustrated

BY CLINTON WILDER CW STAFF

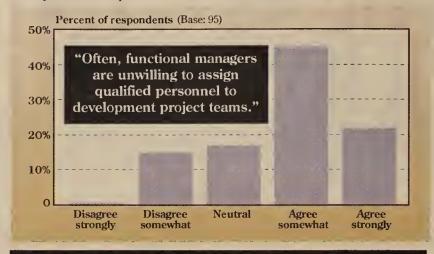
CAMBRIDGE, Mass. — These are not easy times for systems development directors — and computer-aided software engineering is doing little to improve things.

The increased demand to build strategic or cross-functional systems and the unfulfilled promise of new CASE tools to help build them have caused much frustration, according to an Index Group, Inc. survey of systems development directors released last week. In January, Index's Summit research unit surveyed 95 directors in the U.S. and Canada working at firms averaging \$6 billion in sales and \$12 million in annual development budgets.

Survey respondents were particularly frustrated by the ineffectiveness of the ballyhooed partnership between developers and functional users. Two-thirds (67%) said they believed that

High hurdles

Systems development directors are frustrated by traditional perceptions and inadequate user cooperation



Source: Index Group, Inc.

CW Chart: John York

line managers are unwilling to assign qualified users to project development teams, while 64% said that getting different units to share data across functions was "a major problem."

"We've been hearing that it's hard to build cross-functional systems, and those perceptions are borne out by the numbers," said Nicholas Vitalari, director of Summit and associate professor of MIS at the University of California at Irvine's Graduate School of Management. "It's not just a few firms here and there having this problem; it's across all industries."

Another major problem, directors said, is the lingering perception of the systems development function as technology-rather than business-oriented. Seventy percent of respondents said the function is often viewed by users as "the purveyor of technical rather than business solutions," and 47% said their departments are viewed as an overhead item.

Belying those perceptions, few development directors said they view CASE technology as a top priority. Implementation of CASE tools ranked just 14th on their list of the top 20 systems development issues for the 1990s. The top three issues were developing an information architecture, achieving support for cross-functional systems and strategic systems development.

"Other issues are far more pressing than CASE," Vitalari said. "The real major issue is cultural transformation and making developers more business-oriented. That shows that systems development directors are thinking more like managers than technicians, which is a very positive thing."

### COMPUTERWORLD

Editor in Chief Bill Laberis

Executive Editor Paul Gillin

News Editor Peter Bartolik

Assistant News Editor

Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, Advanced Technology
Rosemary Hamilton, Systems & Software
Nell Margolis, Industry

Senior Writers Alan J. Ryan Maryfran Johnson Joanie M. Wexler

Stoff Writers Richard Pastore Sally Cusack

Maura J. Harrington
New Products Writer
Gary Byrne

Features Editors Glenn Rifkin Joanne Kelleher

Senior Editors
Michael L. Sullivan-Trainor
Amiel Kornel
Joseph Maglitta,
In Depth/Integration Strategies

Mary Grover, Product Spotlight

Manoging Editar, Special Projects
Lory Zottola

Seniar Writer David A. Ludlum Assaciate Editor

Laura O'Connell
Reseorchers
Jodie Naze
Kim Nash

Chief Copy Editor
Donald St. John
Assistant Chief Copy Editor
Joyce Chutchian

Joyce Chutchian
Features Copy Editors
Cathleen A. Duffy
Carol Hildebrand

Copy Editors
Catherine Gagnon
Christopher Lindquist
Kimberlee A. Smith
Toby Dorsey

Design Director Nancy Kowal Graphics Designer Tom Monahan

Graphics Specialist John B. York

Design Assistant Marie J. Haines

Graphics Researcher Kevin Burden Assistant Graphics Researcher

Paulo Costa

Assistant to the Editor in Chief

Linda Gorgone
Editoriai Assistants

Lorraine Witzell
Tammy Gryniewicz
Stefanie McCann

Rights ond Permissions Manager Sharon Bryant

> Back Issues Margaret McIndoe

News Bureaus Mid-Atlantic

201/967-1350 Amy Cortese, Correspondent

Washington, D.C.
Mitch Betts, National Correspondent
202/347-6718
Gary H. Anthes, Correspondent

202/347-0134 West Coast

415/347-0555
Jean Bozman, Senior West Coast Editor
J.A. Savage, Senior Correspondent
Charles von Simson, Senior Correspondent
James Daly, Senior Correspondent
Jim Nash, Correspondent
Chris Flanagan, Editorial Assistant

Midwest 708/827-4433 Ellis Booker, Correspondent

IDG News Service Penny Winn, Director

Main Editoriai Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Fax: 508/875-8931

MCi Mail: COMPUTERWORLD Subscriptions: 800/669-1002

## Users bypass war over distributed standards

BY ELISABETH HORWITT

MOUNTAIN VIEW, Calif. — With yet another standards tiff brewing in the Unix arena — this time in the area of distributed computing — some users indicated they will ignore the sounds of battle and bring in whatever seems to get the job done.

Sun Microsystems, Inc. threw down the gage two weeks ago by announcing its long-term plans to support and enhance its Open Network Computing (ONC) system "as the de facto standard," no matter what the Open Software Foundation (OSF) chooses this week as the official distributed computing standard.

The OSF is widely expected to choose the Decorum proposal — offered by a group that in-

cludes IBM, Hewlett-Packard Co., Locus Computing Corp. and Transarc Corp. Users with immediate distributed computing plans could face the dilemma of choosing between a widely installed "de facto" standard and an "official" standard that is likely to have far broader industry support when it matures in two to four years, according to Steve Wendler, a program director at Stamford, Conn., research firm Gartner Group, Inc.

However, users said that the state of the standard will have little to do with their long-term distributed computing choices. "I don't believe we'll run to Decorum simply because OSF codifies it," said Edward Zaharewicz, a systems architect at The Putnam Companies.

Right now, the Boston-based investment firm's distributed computing environment makes

use of the complementary strengths of both Sun's Remote Procedure Call (RPC) — which is the basis of Sun's distributed platform — and the HP Apollo Division's Network Computing System (NCS), which forms the nucleus of the Decorum proposal. While Sun's RPC "does have broader multivendor support," NCS has more functionality in such areas as locating resources on the network, Zaharewicz said.

Charles Schwab & Co. is still evaluating whether RPC technology is the right foundation for its distributed application platform, "but we will make our choice on the basis of whatever gives us the best multivendor interoperability, not what OSF chooses," telecommunications analyst John Payne said.

The one component of Sun's ONC that has a claim to de factostandard status is Network File System (NFS), Wendler said. NFS, which is also a major component of Sun's submission to the OSF, reportedly is installed on 1.2 million nodes. However, the fact that Sun's RPC technology was developed originally for NFS is a minus rather than a plus, given that users want a distributed computing platform that goes well beyond file-sharing applications, Wendler indicated.

Sun has sought to enhance ONC's appeal through alliances that broaden its networking support and through recently announced enhancements (see story page 66).

Enhanced or not, however, Sun's ONC will be passed over by the OSF in favor of a combination of Decorum and DEC submissions, Wendler predicted. While DEC is not yet a formal member of the Decorum alliance, the company is "talking with Decorum and may support and contribute" to the system more strongly in the near future, according to DEC spokeswoman Jacqueline Kahle.

Users who go ahead and install Sun's distributed computing products now could have a difficult time bringing in Decorum in the future unless they have the foresight — and technical facilities — to develop their own "vendor-independent layer between their applications and RPC," Wendler said.

Some users see no problem with carving out their own strategies while they wait out the RPC wars. "It's great that there will be a recognized standard, at least on paper, but until it's accepted as such in the industry, it's just that — a paper standard," Zaharewicz said.

### CORRECTION

In an April 9 Product Spotlight article, Texas Instruments, Inc.'s Information Engineering Facility was incorrectly described as a full life-cycle product that started out as a set of non-integrated tools. In fact, IEF was originally designed as a fully integrated product.

The March 12 article "CA follows the integration trend" misidentified Unitech Systems, Inc. as Unitech Software, Inc. and incorrectly indicated that Unitech Systems bases its strategy on acquired rather than internally developed products.

### Rival camps

The leading candidates for the Open Software Foundation's distributed computing platform standard have lined up their allies

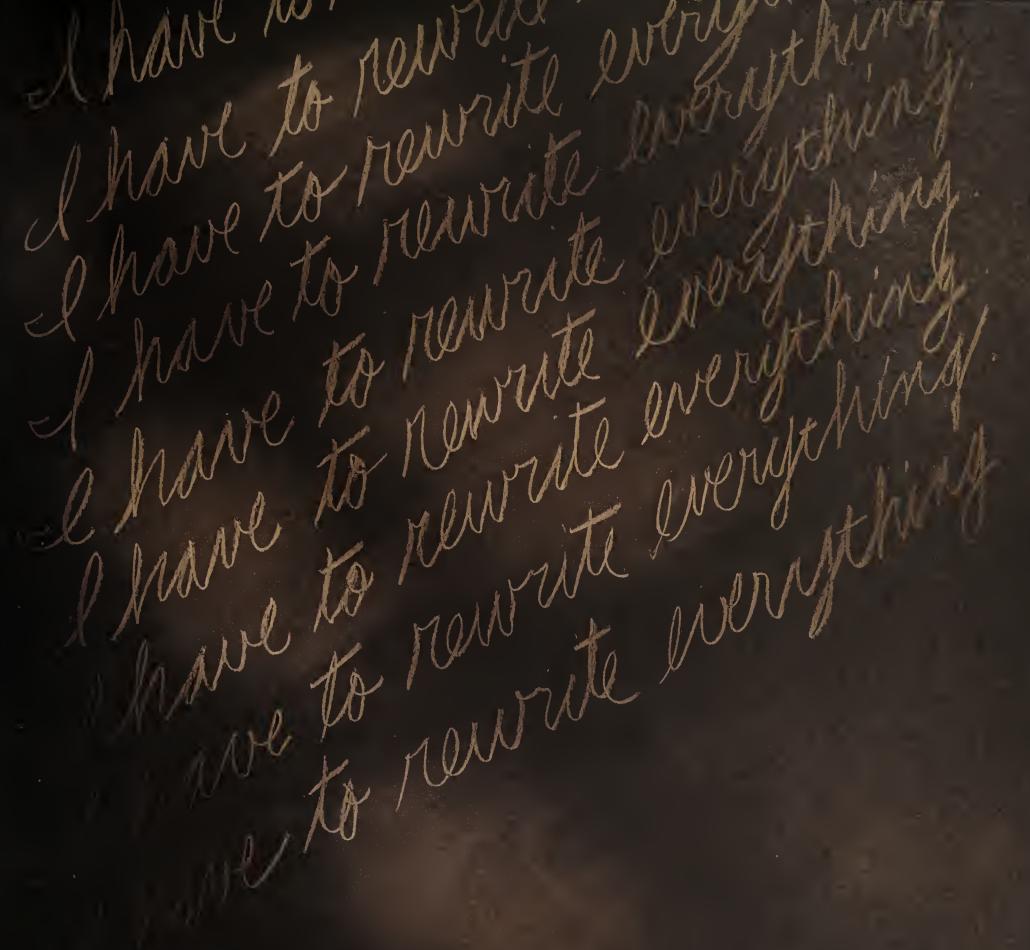
Sun Microsystems' Open Network
Computing platform

Supporters: AT&T/Unix International, 3Com Corp.,
Novell, Inc., Banyan Systems, Inc., Netwise, Inc.

(More than 90 companies are shipping Sun's
Network File System and/or Remote
Procedure Call, which are major
components of the Open
Software Foundation
submission)

(Both Microsoft Corp. and
Digital Equipment Corp. are
joint submitters and endorsers
of several components of the
submission)

CW Chart: Tom Monahan



### You Shouldn't Be Punished For Moving Up To A Relational Database.

You should be rewarded.

With CA-DATACOM/DB® or CA-IDMS/DB® you can now have relational technology while protecting your current application investments.

Only CA transparency software offers you, the VSAM, DL-1, TOTAL or IMS user, the unique opportunity to run all your current applications in a relational environment

without any rewriting.

Ultimately this saves you millions of dollars because existing applications that took hundreds, perhaps thousands of man hours to create are ready to use as is. The moment you switch over to high-performance

CA-DATACOM/DB or CA-IDMS/DB you can unify all your data and applications into a single relational environment. With no expensive conversions. No relinking. And no recoding.

What's more, CA relational database technology will protect your future investments with SQL support, compatibility and portability across multiple platforms.

Call Dana Williams at 1-800-645-3003 and find out how thousands of our clients moved up to a relational technology easily and economically. We promise it will be a rewarding

experience.

MOMPUTER' SSOCIATES

### NCR to ship high-end systems with zip

But company's marketing woes could bog down products, analysts say

BY RICHARD PASTORE CW STAFF

NEW YORK — NCR Corp. moved to solidify its presence in the high-end personal computer market last week, unveiling Intel Corp. I486-based systems and a 486 upgrade chip. However, NCR's sales force stands on shaky ground when it comes to marketing the products, analysts said.

The desktop PC and deskside server, to ship next month, are among the first with the 33-MHz 486 chip, the fastest Intel processor available. It delivers 32% faster performance than the 25-MHz version, Intel said.

"NCR is trying to break out of its mold as a vertical solution vendor and become a leading vendor of client/server systems," said Paul Zagaeski, an analyst at The Yankee Group in Boston. "This [introduction] helps establish that presence."

The company also announced what it calls "I486 upgrade technology" for its 20-MHz Intel 80386SX-based PCs. By installing the \$3,500 upgrade board, users of NCR's PC386SX/MC20 PC can achieve faster performance than a 33-MHz Intel 80386-based PC in most applications, NCR said.

"This is how we are helping

users deal with their hardware uncertainties," said Alok Mohan, vice-president of workstation products at NCR.

Offering this kind of hardware flexibility and investment protection is a growing trend among PC vendors, analysts said. "It's a response to user demand to prevent early obsolescence," Zagaeski said.

Although they were not sure they would take advantage of it, NCR PC users praised the upgrade. "I think it's a good idea," said Dennis Melville, vice-president of information services at Big V Supermarkets in Florida, N.Y. "We're putting in larger disks and memories, so the capability to kick it up to a faster box is desirable."

"It gives the user more flexibility," said Toys 'R Us data center director Paul Gallico, who said he feels more comfortable knowing NCR offers such an upgrade path.

However, analysts are not comfortable with NCR's ability to sell new accounts on the upgrade and high-end PC technology. "The most difficult thing will be to market the upgrade. For a long time, they couldn't even decide what to call it," said Robert Cameron, associate director of northeast research at Dataquest, Inc.

NCR's new desktop strategy, dubbed Open Cooperative Computing, "is a difficult concept for anybody to sell," especially for a sales force most used to peddling vertical systems, Zagaeski said.

Another potential problem is brewing in Businessland, Inc. stores. When NCR signed a much-touted reseller contract

### Mini makers' micros

NCR's 27-MIPS desktop system and server employ a speedy I486 microprocessor

CPU	Intel Corp. I486, 33-Mhz
I/O bus	IBM Micro Channe Architecture
Memory	4M to 64M bytes
Hard disk	Desktop: 100M/ 200M/320M bytes Server: 200M/ 320M/640M bytes
Graphics	Super VGA
Base price	Desktop: \$14,195 Server: \$16,195

Source: NCR Corp.

CW Chart: John York

with Businessland last November, it was hoping to fill the shoes left vacant when Compaq Computer Corp. pulled out of the retail chain last year, analysts said. Compaq's recent return, however, has thrown cold water on NCR's aspirations, analysts said.

### Frito-Lay to crunch a bunch of bytes over satellite net

BY SALLY CUSACK

DALLAS — Driven by new applications, including an executive information system (EIS), that were going to double demands on its existing land-based network system, Frito-Lay, Inc. has signed a contract with Scientific-Atlanta, Inc. for the installation of an extensive satellite network.

Scientific-Atlanta will install and maintain the turnkey Skylinx X.25 very small-aperture terminal (VSAT) satellite network designed to transmit information to and from the 10,000-person sales force and connect all 300 U.S. manufacturing, sales and distribution locations for the snack food maker. Frito-Lay, a subsidiary of Pepsico, Inc., posted \$4.5 billion in retail sales last year.

The network will reportedly include a 7-meter master earth station located in Dallas and 300 two-way 1.8-meter VSATs. The vendor will handle all satellite transponder services for five years, under the terms of a 24-hour-per-day facilities manage-

ment contract.

According to Dan Smith, Frito-Lay's MIS communications consultant, the company was very satisfied with its 9.6K bit/sec. AT&T multidrop landbased network, but the addition of an EIS and several other advanced applications would require true peer-to-peer communications capabilities.

"We have a very sophisticat-



Frito-Lay's satellite network makes tracking snacks easier

ed information architecture," Smith said. "It is essential that we move large databases back and forth between locations."

The company examined every possible solution, Smith said, including Tariff 12, fractional T1 and AT&T's Spectrum, and considered a total re-engineering of the existing multidrop network.

"We were surprised we ended up with VSAT," Smith said.

There are currently a dozen pilot sites up and running on the new network, and Scientific-Atlanta estimated that the entire installation will be completed by September. The system provides X.25 standards-based architecture and is built on packetswitching technology — features that were pivotal in cinching the Frito-Lay contract, Smith said.

The CCITT Skylinx X.25 architecture supports four link protocols at each remote site and is also capable of LAN-to-LAN communications. This permits the development of automatic dial-up recovery to restore individual site failures by reconnecting failed locations to the hub packet switch and allows a normal site failure to be recovered by the hub without intervention by the host, Smith said.

Scientific-Atlanta will also provide a backup hub capable of restoring the entire network.

### Leasing

FROM PAGE:

third-largest computer leasing company in the world into sudden and huge insolvency. As of last week, Atlantic PLC estimated its loss at more than \$1 billion.

The computer leasing industry, heavily dependent on IBM equipment, has been reeling from the success of IBM's own leasing arm, IBM Credit Corp., which is currently wolfing down an estimated 50% of the approximately \$24 billion U.S.-based computer leasing market and gives every sign of being hungry for more.

"Basically, IBM Credit is the problem for all us," said one leasing company asset manager. "But this," he added, citing Hassett's warnings, "is pretty scary."

Users lose when lessors smudge moral and legal lines, Hassett said. Such practices are warning signs of an unstable leasing company, and if the lessor collapses, their customers may be pitched headlong into confusion as to their rights and obligations, he said.

Leasing deals are by nature a Byzantine morass of contracts, subcontracts and side deals transacted among various financing sources and investors to provide attractive equipment usage costs. The equipment user may not even be aware of all the parties involved in the financing, which is often sealed by documents that few can understand. At any given moment, the computer lessee cannot be certain which party holds what papers and who owes what to whom. "Do I feel jeopardized? Of course I do; common sense alone would see to that," said an Atlantic user who requested anonymity.

For the leasing companies, the upshot of a continued walk on the wild side could be even worse than the collapse of major leasing firms, Hassett said. "He who sells what isn't his'n, pays the price or goes to prison," he said, quoting an old childhood rhyme.

Hassett made it clear that the abuses he detailed were not confined to a few troubled firms. Furthermore, he said, "I know of at least one U.S. attorney who is looking into this right now." He urged CDLA's industry practices committee to do the same.

An analyst close to the computer leasing market who requested anonymity affirmed that practices such as those detailed by Hassett, while not universal, are frequently found.

Kenneth Steinback, chief executive officer of St. Louis-based Computer Sales International, Inc. and chairman of CDLA, said that both the professional association and his own leasing firm are still in the process of sorting out Hassett's accusations. Any comment from either, he said, would

be premature.

"However, if you want one man's opinion," Steinback said, "I think that [the Hassett address] raised some important points but was very, very, very exaggerated."

One leasing industry analyst, Thomas Donovan, director of information strategies at Framingham, Mass.-based Technology Investment Strategies, Inc., said that if there is rampant wrongdoing within the leasing arena, he is unaware of it.

What there is, Donovan said, is a great deal of aggressive business dealing and accounting, none of which is unlawful, provided that it is accurately accounted for on the company books.

"There's no black and white on a lot of these issues," Donovan said. "There's mainly a lot of grey."

### Signs of trouble

Some of the questionable practices cropping up in the leasing industry leave end users liable to more than one party for the same computer equipment—sometimes for computers not even on the premises, warned James Hassett, an expert at leasing company reorganization.

Fortunately, there are warning signs of a leasing company in trouble, Hassett said. He offered tips for prudent lessors:

• Eliminate the consistently lowest bidder. The deal that looks too good to be true usually is. "I know one company that consistently selects the lowest bidder," he said. "It's now caught up in its second [lessor] bankruptcy situation, and it's paying dearly."

• Check out the chief financial officer's clout. Lack of financial discipline has characterized virtually every leasing company that has gone south, regardless of the route it went by.

• Do not give in to greed. All too often, lessees and lenders who get sideswiped as a leasing company falls were complicit in their own injury in that they blinded themselves to intuition and common sense in the name of the bottom line. "Lessees are greedy for the best deal; lenders are greedy for the highest deal," Hassett noted.

**NELL MARGOLIS** 

# Introducing the best thing to happen to systems and network management since NET/MASTER.

## NET/MASTER from Systems Center.

Ever since its introduction, NET/MASTER has earned high praise for its unique combination of integrated network management, automated operations, network control language, and outstanding ease of use.

Now NET/MASTER has even more to offer: the worldwide resources of Systems Center—a proven leader in systems and network software, and a responsive vendor with a history of innovation and commitment to customer partnership.

NET/MASTER is already making great things happen at nearly 2000 installations. To see what it can do for you, contact Systems Center, Inc., 1800 Alexander Bell Drive, Reston, Virginia 22091, (703) 264-8000.

A New York Stock Exchange company.



Copyright 1990 Systems Center. Inc.

NET/MASTER is a trademark proposed to be transferred to Software

Developments International Pty Limited or Systems Center. Inc.

### **NEWS SHORTS**

### Wait goes on for System 7.0

Apple Computer, Inc. officials confirmed last week what thirdparty developers have suspected for months: Apple's upcoming System 7.0 operating system will not be available until the end of the year at the earliest. Apple had hoped to get the new version out by summer and gave no specific reason for the delay when it was announced at a software developers conference. Some insiders said Apple has put development in neutral to see what Microsoft comes up with next Tuesday when it plans to introduce a new version of its Windows interface.

**Xerox loses Apple suit** 

The last remaining count in the lawsuit over the technology behind the icon-based graphical user interface employed in Apple's computers was dismissed last week. Xerox Corp. filed the suit in December 1989, asking the court to cancel Apple's patent registrations and charging that the company is profiting unjustly from work that Apple founder Steve Jobs did in a joint project with Xerox.

. . . . . . . . . . . . .

### Motorola targets multimedia

Motorola, Inc. hopes to begin riding the wave toward multimedia applications today with the introduction of an auxiliary processor designed for the demands of applications that offer both high-quality sound and color graphics. The 32-bit 96002 floating-point dual processor is based on the same architecture as Motorola's 56001 24-bit fixed-point processor. Volume shipments of the 96002 will begin in the fourth quarter.

### E-mail directory forum established

. . . . . . . . . . . . .

When representatives of 16 corporations met at Western Union Corp. headquarters in Upper Saddle River, N.J., late last month, they agreed to form an industry forum to develop an electronic directory service based on the CCITT X.500 recommendations. Plans call for the forum to meet quarterly to complete an aggressive program that will lead to full commercial availability of a North American electronic directory service.

. . . . . . . . . . . . .

### **AT&T upgrades Systimax**

AT&T last week introduced a new cable for its Systimax Premises Distribution System said to support speeds of at least 20M bit/sec. over distances of up to 328 feet from the wiring closet. Systimax 2061 unshielded twisted-pair cable is designed to interconnect high-speed token-ring workstations through the Systimax wiring hub. Meanwhile, AT&T approved Proteon, Inc.'s Pronet 4/6 network interface cards for use with Systimax, according to Proteon.

. . . . . . . . . . . . . . . .

### **IBM** to supply Amadeus

IBM recently won a bid worth an estimated \$400 million to sell as many as 55,000 Personal System/2s to the Amadeus travel reservation consortium. The contract is one of the largest volume deals in IBM's history, a company spokesman said. Madrid-based Amadeus will resell the systems to travel agents and partners across Europe. Amadeus' international partners include Air France, Lufthansa and Iberia Air Lines of Spain. The range of PS/2 models will be configured with Amadeus' travel agency management software running under DOS, OS/2 and Unix.

. . . . . . . . . . . . .

### AT&T offers cut-rate ISDN link

Seeking to make Integrated Services Digital Network (ISDN) economically attractive to residential and small business users, AT&T and Micom Communications Corp. last week announced a \$500 ISDN adapter for IBM Personal Computers. The Personal Computer Terminal Adapter Model 1000 does not take full advantage of the ISDN Basic Rate Interface in that it supports only voice on the two 64K bit/sec. B channels, allocating data transmissions to the 16K bit/sec. D channel. A more powerful and functional ISDN adapter costs about \$1,400.

More news shorts on page 127

### Of worms and wars at DECUS

BY MARYFRAN JOHNSON CW STAFF

NEW ORLEANS — Amid the usual pomp and nonsense of trade show exhibits, some 6,500 Digital Equipment Corp. customers gathered last week to swap war stories about everything from network security and personal computer networks to the wars between DEC and IBM.

While no single issue dominated the semiannual Digital Equipment Computer Users Society (DECUS) meeting, there was intense interest in network security in the wake of the Robert T. Morris sentence for his worm program that paralyzed several thousand computers on the Internet research network.

"A lot of the folks I've talked to think the [Morris] sentencing was too lenient because there was no jail time. That sends a bad message on computer crime," said Robert Weston, a research engineer at NASA Langley Research Center in Hampton, Va.

Security problems were cited frequently by VAX/VMS users

as the major stumbling block to acceptance of Ultrix, DEC's version of the AT&T Unix System V operating system.

Users were also keenly interested in a promise from DEC Vice-President Dominic LaCava that the company will deliver a PC-sized VAX, possibly by the end of the year.

During a question-and-answer period following LaCava's keynote address at DECUS, one customer asked when he could count on a fully configured, stand-alone PC running VMS. "Right now, you'd have to mortgage your house to get that," said Dick Gilbert, mechanical engineer at Princeton University.

### **Desktop VAX**

LaCava responded that "far lower cost VAXs for the desktop" were coming. However, when pressed by other users about a laptop computer running VMS, LaCava said DEC would have to get more feedback from users about demand for laptops.

"If I had a VAX at home, I'd be a happy man," declared Rob-

ert Moss, a physicist and systems manager at Texaco, Inc. in Houston. "MS-DOS is the pits when you're used to programming on a VAX."

DEC officials made much ado about celebrating the 20th birthday of the old 16-bit war-horse PDP-11 minicomputer, introducing two new systems, the PDP-11/93 and 94.

"This is a nice life-cycle extension," said Bill Brindley, president of the users society and a systems manager at the U.S. Naval Security Group in Washington, D.C. "It could amount to a real cost savings for a number of organizations."

As always, the perennial issue of IBM vs. DEC competition cropped up frequently in conversation.

"We're seeing a more prominent role for VAXs," said Ernie Meier, systems manager at the Kerr-McGee Corp. in Oklahoma City. The company recently ordered a VAX 6000 Model 410 to run new manufacturing software and expand a three-machine Vaxcluster.

### **Windows**

FROM PAGE 1

The only hitch in Lotus' embrace of Windows is a two-phase approach that may overwhelm Intel Corp.-based personal computer users, who will find themselves forced to choose from as many as four versions of 1-2-3 over the next 12 months, all of which support DOS, three of which offer some level of OS/2 support and two of which offer some level of Windows support.

In addition to a full-blown, future Windows implementation, which some have dubbed "1-2-3/W," Lotus also announced 1-2-3 Release 3.1. Available in September, it corrects the debilitating lack of publishing functionality in the barely 1-year-old Release 3.0, which it also replaces. It also gives Lotus a quick opening into the Windows market by offering a limited plate of Windows capabilities.

"Release 3.1 will be an exciting product. A lot of our people are still running 2.2 precisely because 3.0 lacked its publishing capabilities," said Sheldon Laube, director of information and technology at Price Waterhouse.

Lotus executives offered few details about the company's statement of direction for the Release 3.1 follow-up, 1-2-3/W. But sources close to Lotus said they were told to look for it in the first half of 1991.

"We are already flirting with the edge of vaporware," Ingari acknowledged. "The only reason we are announcing now is that there is so much hype and confusion around this new Windows release [3.0] that our customers need to know now.

"It's only 5% of the market, but Windows creates 50% of the noise," Ingari quipped.

In the short term, Lotus expects the 1-2-3 Release 3.1 to grab some sales by placating demand for Windows support.

The planned September release of 1-2-3 Release 3.1 will support DOS 3.0 and Windows 3.0. It will be followed by a character-mode OS/2 version. Key to 3.1 is the addition of sorely lacking desktop publishing and graphics capabilities via Impress, technology Lotus purchased from a French company called Aleph 2. "Impress goes totally beyond publishing; it gives us an advanced graphical spreadsheet," Ingari said.

#### **Not Allways**

In turn, Lotus has scrapped plans to further evolve the Allways publishing technology used in Release 2.2.

Release 3.1 runs as a "well-behaved" DOS application in full-screen mode under Windows 3.0. Users can launch it from an icon, task switch between applications without having to boot one of them down and take advantage of Windows 3.0's memory management scheme, as well as cut, copy and paste from Windows' clipboard.

In addition, the incorporation of the DOS Protected Mode Interface will ensure support for Windows multitasking and use of virtual memory.

1-2-3/W will have at least the

functionality of Release 3.1 as well as the look and feel of the 1-2-3/G Presentation Manager interface, Ingari said. Sherlund predicted that 3.1, an "interim product," will "get squeezed out," once 1-2-3/W ships.

1-2-3/W will offer full functionality in sizable windows, support Microsoft's Dynamic Data Exchange protocol and use an IBM Common User Access-style interface.

Ingari dismissed the views of critics such as Nancy McSharry, an analyst at International Data Corp., who said Lotus may find itself confusing one audience with four choices: 3.0, 3.1, 1-2-3/W and G.

"Users have so many operating system and hardware environments to choose from, Lotus is forced to offer multiple versions," Ingari responded. "Let the customer choose and exert pressure on the operating system providers, and we'll make our products available on whatever they want to buy."

Laube, for one, is not confused. He said Price Waterhouse will take advantage of Release 3.1, 1-2-3/W and, in the longer term, 1-2-3/G. He said he expects to wind up with a shop split between 1-2-3/W and 1-2-3/G.

The reason for Lotus' dual approach with Release 3.1 and 1-2-3/W is twofold, Ingari said. "We wanted to get to market quickly with something supporting the upcoming version of Windows that would ship [close to when] it does," he explained, referring to Release 3.1. That goal prohibits Lotus from offering a full Windows implementation off the bat.

### **Closing Arguments**

Only ORACLE supports virtually every vendor's software, hardware and network.

Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

Software is "open" only if it adheres to industry standards and works with products from other vendors.

# A SEASIBARDS

# O DE LA CONTRE CIURE

specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

An open database should also work with other vendors' applications. ORACLE works with DEC's All-in-1, DG's CEO, IBI's Focus and SAS. And it supports PC and Mac software like Lotus 1-2-3, WordPerfect, Borland's Paradox and Apple's Hypercard. Even Dbase applications run on ORACLE.

Software is open if it runs on every vendor's operating system. ORACLE runs on MSDOS, OS/2, Mac OS, UNIX, VMS, MVS and virtually every other operating system on the market.

And software is open if it supports every vendor's network. ORACLE supports IBM's LU6.2, LAN Manager, NetBIOS, DECnet, Novell's SPX/IPX, industry standard X.25 and TCP/IP and many others.

Choosing open software today lets users choose any vendor's hardware, software and network tomorrow.

Call 1-800-ORACLE1 ext. 8197 to sign up for an Oracle Database Conference near you. And keep your software and your options open.

Call
1-800-ORACLE1
Ext. 8197
to sign up for the
Database Conference
in your area.

**ORACLE** 

Compatibility • Portability • Connectability

### Novell boosts Netware's OS/2 access

Requester upgrade includes full support for Named Pipes

BY JIM NASH

Novell, Inc. moved last week to give Netware network users greater access to OS/2 applications by providing enhancements to its Netware Requester for OS/2 and its DOS shell.

The Provo, Utah, networking firm's Requester software for OS/2 Version 1.2 includes full support for Named Pipes. That, said Mark Calkins, vice-president of Novell's Netware products division, provides users with "totally transparent" ac-

cess to SQL servers, including a listing of all SQL servers on the network.

The enhanced Requester, which is expected to ship next month, gives users a choice between Microsoft Corp.'s LAN Manager network and Netware. SQL servers, which operate on IBM OS/2 boxes, had required LAN Manager networks.

"That's a biggie. That's good news," said Dave Hoisve, project director at the University of Utah's computer center. Hoisve, who has yet to see the new product, added, "We're in a position now where a few applications that are coming

out require us to start introducing OS/2."

Tim Yates, an associate at W. L. Gore & Associates in Newark, Del., said his firm has served as a beta-test site for the new version.

"It's working very well," Yates said. "It is allowing the front end to talk to the SQL server over a Netware LAN without having to run LAN Manager." That flexibility, he said, could mean substantial savings.

Microsoft spokesman Collins Hemingway chose to focus on the potential that Novell offers for increasing demand for SQL Server, rather than the possible challenge to LAN Manager. "LAN Manager was engineered alongside OS/2, but if [Novell's announcement] were to somehow create a competitive advantage for Netware 386, we would move to stay competitive," Hemingway said.

Calkins said the enhanced version of Requester provides all the print services available to DOS and OS/2 clients. Previous versions, he explained, stopped at rudimentary print functions.

Novell said it will make Netware DOS Shell Version 3.01 available this month as a free upgrade. The new version sports extended and expanded memory, according to Bob Young, a product line manager at Novell. It will support the next release of Microsoft's Windows, he said.

The shell, which works with Novell's IPX transport, can be removed from the core and placed in higher memory, freeing 34K bytes of conventional memory. It frees 33K bytes of expanded memory.

# Our back-up gives you no os, for a

lot less



The ChannelAxcess 9522 holds over two gigabytes of IBM data on an 8mm cartridge. That's equivalent to 13 bulky tape reels-all in the palm of your hand. You'll also save costly man-hours spent on data back-up. In a single, unattended session, the 9522 can back-up the equivalent of 91 tape reels. Data integrity? The 9522 boasts a non-recoverable error rate of less than one in 10<sup>13</sup> bits read. And these features come in a form factor that fits in your standard rack. Call today for details on the ChannelAxcess 9522.

800-531-5167



Channel Axcess is a trademark of Andrew KMW Systems. All other brands are trademarks or registered trademarks of their respective holders.

© 1990 Andrew KMW Systems



# Banyan signs on to LAN Manager BY JOANIE M. WEXLER CW STAFF WESTBORO, Mass. — Long chided for

WESTBORO, Mass. — Long chided for being asleep on the marketing side, networking software vendor Banyan Systems, Inc. last week announced it will link up with market trendsetter Microsoft Corp.'s networking scheme.

As a result of a cooperative alliance with Microsoft, Banyan Virtual Networking Software (Vines) personal computer-based corporatewide networks and servers will interoperate with Microsoft's OS/2-based LAN Manager local-area networks, and developers will be able to write DOS- and OS/2-based network applications that can run on both Vines and LAN Manager, Microsoft's network operating system.

Bill Sheehan, network manager at the Commonwealth of Massachusetts Metropolitan District Commission, is running a Vines network but is not yet supporting OS/2. "If this announcement has any relevance for me today," he said, "it would be that the marketing division of Banyan—always its weakest link—is starting to pick up."

Banyan's marketing mistakes are typically described as the company not moving from its direct sales force to reseller distribution channels early enough and simply not "getting the word out" about how its technology advantage could support business solutions.

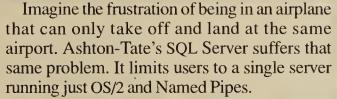
Mary Modahl, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., said, "The good news for users is that all the three major network vendors [Novell, Inc., 3Com Corp. and Banyan] now support LAN Manager APIs, and independent software developers can focus on a set of applications for network computing.

"Microsoft's strategy is ultimately to compete with Banyan," Modahl said. "Banyan has a technology leap and a window of opportunity, and Microsoft's engineers are undoubtedly hard at work to shut that window."

Banyan's technology leap is its Street-talk global naming service, which allows users to access resources anywhere on a corporatewide Vines network — a more elegant solution to corporatewide networking than using interconnection products such as routers, bridges and gateways.

# Opening Database Servers To The Whole World

ORACLE Server. Nonstop data sharing among PCs, Macs, minis, and mainframes.



ORACLE® Server is different. As an open server, it works with virtually any network, any operating system, application or database system.

So ORACLE can act as an information hub to share data across an organization's PCs, Macs,

Query to remote 05/2 Server

Query to Dbase application to VAX VMS

Update from 1-2-3 spread sheet to DB2

Ashton Tate SQL Server

Datasharing among connected

Update from SQL\*Forms to VINES database

Shares data within the LAN.

minis and mainframes.

ORACLE Server works with existing Novell, 3Com, and IBM LANs as well as Lotus 1-2-3 and Dbase applications.

It even allows access
to corporate data stored
in other vendors'
software such as
RMS on DEC minis
and DB2 on IBM
mainframes.

And only Oracle provides a set of integrated tools for portable application development,

office automation and CASE. It also has interfaces to the most popular programming languages.

All this is backed by the

and support organization of any software company in the world.

Call 1-800-ORACLE1 ext.8193 to buy ORACLE Server for OS/2 for \$2499 and get six months of free upgrades and phone support.

Or you can try the 3-user Developers Version for \$699.

Because no one wants to be all hooked up with no place to go.

Supports virtually all operating systems: OS/2, VINES, UNIX, Netware 386, VMS, MVS

**ORACLE Server** 

Supports virtually every vendor's Network: Novell's SPX/IPX, NetBIOS, Named Pipe

Allows access to other vendor's databases: DB2, SQL/DS, RMS.

Multiple user interfaces including Dhase and 1-2-3.

Complete set of programming tools.

Supports multiple programming languages, C, COBOL, FORTRAN, PL/1, Ada.

1990 Schedule April 25 New York, NY April 27 Portland, OR May 22 May 24 San Jose, CA June 5 Detriot, MI Washington, D.C. June 7 St. Louis, MO June 12 June 14 Denver, CO Boston, MA June 26 June 28 Chicago, IL Call ex 8193 and sign up for the

**ORACLE Client/Server Forums** 

**ORACLE**°

Compatibility · Portability · Connectability

### Pan Am/AT&T futuristic airport plan takes off

BY JOANIE M. WEXLER CW STAFF

MIAMI — In one of its largest contracts to date, AT&T Computer Systems has landed a \$40 million role in Pan American World Airways' emerging integrated data network.

The two companies announced last week that they have signed a five-year agreement under which AT&T will provide 10,000 Model 6386/SX and 6386/25 Workgroup Systems to about 100 Pan Am airport, reservation, operational and administrative locations worldwide. AT&T will also service and maintain oth-

er vendors' equipment in the airline's international network.

The personal computers will form the foundation for what Pan Am describes as its "airports of the future." Pan Am's plan calls for token-ring local-area networks at each airport connected with other facilities over an X.25 backbone.

The new network, which Pan Am started building several months ago, was designed to automate every point of contact between passenger and airline and thus reduce passenger wait times and slash Pan Am's operating costs by \$15 million to \$20 million per year, according to Robert O. Wagner, Pan Am's vice-

president of information services.

AT&T won the PC leasing contract after a competitive bidding process that included IBM, NCR Corp., Unisys Corp. and Westinghouse Electric Corp., according to Wagner.

The stepped-up service goals Pan Am expects to achieve with its new network include reducing check-in time for passengers with tickets from the more than four minutes it now takes to between 1-1½ minutes, Wagner said.

Tickets and boarding passes will be combined and will contain magnetic stripes encoded with passenger and flight information to provide a continuous audit trail for the check-in function. Laser gun readers in the baggage makeup room will specify in a passenger's on-line record which container his bags have been loaded into. "FAA regulations state that if a person has not boarded, the airline must unload his bag," Wagner explained. "On a 747, which can have 20 containers of baggage, that could cause a two-hour delay. Now, we will be able to go right to the proper container."

### Toshiba's Sparc laptop debuts

BY JAMES DALY

Sun Microsystems, Inc. scored a victory last week in its bid to have other computer makers clone its technology when Japan's Toshiba Corp. announced the first portable workstation based on Sun's Scalable Processor Architecture (Sparc) microprocessor design.

However, analysts offered one bit of advice for those interested in getting Toshiba's Sparc LT laptop: Have a big lap.

The machine is heavy in both price (\$13,200) and poundage (17.7 pounds) and is not scheduled to be available in the U.S. until early next year.

Instead, observers suggested the Sparc LT is a way for Toshiba to test the water for an entry into the desktop market. The Sparc LT "is really just a computer an engineer can use all day and then take home," said David Card, an analyst at International Data Corp. "If Sun thought there was a market for a laptop this year, they would have done it themselves. Neither company is fooling the other."

The Unix-based Sparc LT is essentially a stripped-down version of Sun's Sparcstation. Toshiba officials said the machine can process 13.2 million instructions per second and features a fold-up screen, 8M bytes of internal memory, a 180M-byte hard disk drive, a 3½-in. floppy disk drive and an LCD. It will reportedly be available in Japan in July.

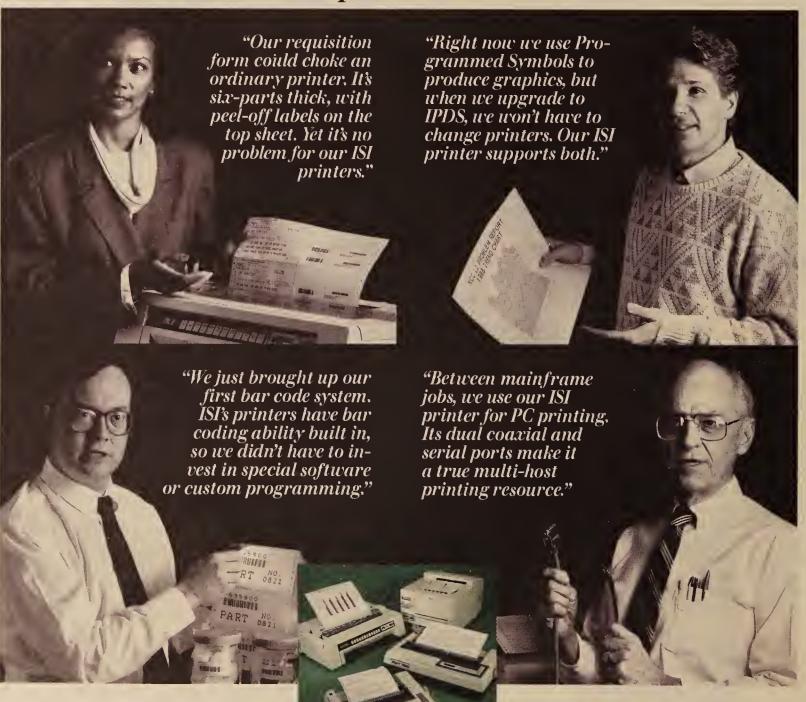
The model is the result of a May 1989 agreement between the two firms, under which Toshiba obtained the right to manufacture computers based on Sparc.

Analysts said the team-up makes a good fit, because Mountain View, Calif-based Sun is able to offer the expansive software base that Japanese companies have traditionally lacked. "This could be a very big step for Toshiba, because it takes away a big headache in that it doesn't have to worry about building up a software base; it's already there," said Kathleen Hurley, an analyst at Dataquest, Inc.

Some experts have questioned the need for laptop workstations because the scientists and engineers who use them are often networked into high-powered mainframes. As a result, the advantages of portability are not as clear-cut as they would be for personal computer users.

Others disagree. "Most engineers already work ungodly hours, and they're looking for a machine they can bring home to finish up some spare business and enter into the system the next day," said Roger Ross, chief executive officer of Ross Technology, a subsidiary of Cypress Semiconductor Corp., which designed the Sparc LT's chip.

### "Our ISI printers are solving problems the IBM printers couldn't."



Unlike other plug-compatible manufacturers (PCMs), we do not build terminals, drives, or keyboards. Only printers. Our engineers work on nothing else. They combine over 150 years of experience in producing plug-compatible printers for IBM mainframe and midrange system users.

This focus enables us to respond quickly to changes in IBM technology, while building into our printers the advanced output and paper-handling capabilities that IBM and other manufacturers simply don't deliver.

Our printers are shop-floor rugged, yet office-friendly. Simple loading and operations make them easy to use for anyone. And since they connect directly to your IBM systems, you don't have the mess of boards, boxes, or other gadgets.



Interface Systems, Inc.
Printer Solutions for IBM Systems

With Interface Systems, you get proven reliability. Since 1975, we've manufactured plug-compatible printers for thousands of IBM 3270, S/3X, and AS/400 users. Each model is backed by complete documentation, service, and technical support.

You also get PCM economy. Our printers cost much less than corresponding IBM models...extra features and all.

To learn more, call us today at 1-800-544-4072. Or write to us at 5855 Interface Drive, Ann Arbor, Michigan 48103. FAX: 313/769-1047.

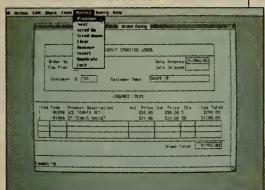
# Making The Same Look Different

Applications built using Oracle Tools automatically adapt to multiple user interfaces.

Developing a program that runs on the entire spectrum of PCs, Macs, Suns and other workstations is next to impossible. Because each computer has its own graphic user interface (GUI), developers must spend months rewriting each application for each incompatible GUI.

Unless the applications are built with Oracle Tools.

#### Macintosh



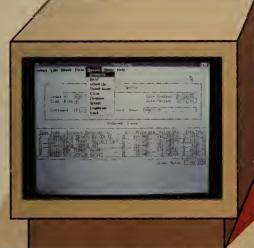


**Character Mode** 

#### **DECwindows/Motif**



ORACLE



Presentation Manager/ Windows 3.0



An application developed with Oracle Tools automatically adapts to the native look and feel of the computer on which it runs. PCs, Macs, Suns or other workstations. Even character and block mode terminals. All without changing a single line of code.

The key to this interface independence is Oracle's adaptable look and feel technology that translates "generic" interface operations into the native windowing system of different environments. So a single application can be easily deployed across an entire organization's PCs, Macs, workstations and terminals. All without recoding.

SQL\*Forms 3.0 and SQL\*Menu 5.0 will support both current and emerging interface standards. X/Motif, DECwindows, Macintosh, Presentation Manager, MS Windows, Next Step, as well as character and block mode terminals.

Call 1-800-ORACLE1, Ext. 8102 and receive the free Oracle Tools Information Kit. It includes demonstration diskettes and product information illustrating the full capabilities of SQL\*Forms and SQL\*Menu.

Developing applications will never be the same. Or different.

ORACLE

Compatibility · Portability · Connectability



3270 Block Mode

### Banks being challenged to pick up EDI gauntlet

BY JIM NASH CW STAFF

Banks, in their traditional roles as business midwifes and partners, have the potential to bring electronic data interchange (EDI) out of its incubation, industry observers said.

Those same observers were quick to add, however, that banks stand to lose much of their power and relevance if they ignore EDI.

That point was made repeatedly in the halls between sessions during last week's third annual Corporate EFT/EDI Con-

ference in Chicago.

Those institutions that decide to heed EDI are likely either to lead the way with new products and services or to follow the lead of others, said Ned Hill, a professor at Brigham Young University's school of management.

Followers, Hill explained, will

probably survive by purchasing EDI franchises such as those offered by the National Bank of Detroit, which franchises its services, equipment and expertise to other banks.

Banks are in an excellent position to promote, facilitate and even service EDI relationships between companies, according to Hill.

While the institutions continue to play a smaller part in corporate financing, banks have an almost unmatched knowledge of individual businesses and their needs, he said.

Hill and others — including competitors of banks in the emerging data-centric market-place — have said banks must capitalize on this knowledge or perish in the financial backwaters.

#### **EDI** matchmaker

Several banks have taken up the challenge. One, First Interstate Bank Ltd. in Los Angeles, has fashioned itself as an EDI matchmaker.

Randy Kahn, First Interstate's vice-president and manager, said that his company is now marketing added services that are tied to its EDI product, Action.

The new services basically amount to a search for logical and complementary trading

HOSE institutions that decide to heed EDI are likely either to lead the way with new products and services or to follow the lead of others.

NED HILL BRIGHAM YOUNG

partners, as well as consultation leading to appropriate EDI tools, Kahn said.

Robert Rosdorff, EDI product manager at First Interstate, said manufacturers and large retail distribution companies have traditionally targeted only current suppliers and those who are seeking to supply goods.

With the new services, he said, First Interstate will bring together partners that were perhaps unknown to one another before.

General Electric Information Services (GEIS), a value-added network company that competes with banks for transferring funds and sales-related data, supports First Interstate's move.

"There's a bank with its head screwed on," said Bill Cafiero, manager of corporate financial services at GEIS. "They are growing the industry."

First Interstate and GEIS worked together to develop GEIS' EDI software, called BPS Central.

Hill stated that First Interstate's program could qualify the bank as a leader in EDI's maturation. Someday, he said, it could put First Interstate on a par with current leaders First Chicago Corp., National Bank of Detroit and PNC Financial Corp.

Get It All Out Of Your System.







EMC memory upgrades and highperformance peripheral subsystems improve the speed and productivity of a wide range of minicomputer and mainframe systems.

You've put a lot more than data into your computer system. You've also invested time, money and a large part of your company's ability to compete effectively. So, with everything that's gone into your system, where should you go to get the full performance you're paying for and counting on? To the same company that already improves computing productivity for over half the Fortune 500.

### What's Gotten Into The World's Largest Computer Users?

These companies rely on EMC Corporation. EMC makes faster, more powerful computers — even though we don't make computers at all. Instead, EMC provides the memory, peripheral devices and systemwide strategic thinking that extend a

computer's speed, capacity and lifeexpectancy. EMC's products boost the capabilities of systems manufactured by IBM, Digital, Hewlett-Packard and Wang. And EMC's 50 worldwide service offices ensure that improved performance stays improved.

If you're ready to get it all out of your system talk to EMC. We're the one computer investment that will make the most of all your others.

For further information about turning your present computer into a better one call us, toll free, at 1-800-222-EMC2, Ext. G9570. (In Massachusetts call 508-435-1000.

1-800-543-4782.) Enhancement Company.

The System

In Canada call

14 COMPUTERWORLD



# The promise of AD/Cycle has just arrived three years ahead of schedule.

Why wait? Software AG's integrated CASE environment puts the promise of AD/Cycle to work for you now. While ensuring compatibility with emerging AD/Cycle technologies in the future.

Based on NATURAL, the world-class development technology, Software AG's CASE environment provides a modular, building-block approach to CASE implementation. So you can design, build and maintain a variety of applications—including knowledge-based systems—at your own pace. With the database you have now. No matter if it's DB2, VSAM,

IMS, DL/1, SQL/DS or ADABAS on an IBM platform. Or RMS, Rdb or ADABAS on Digital's VAX.

The Software AG CASE environment covers all aspects of the application's life cycle—with analysis and design tools, code generation capabilities, repository-based management and integrated testing functions. All designed to work together. Now. The resulting applications are available through a consistent, easy-to-learn interface—with friendly features like active help, pull-down menus, windows and color graphics—that gives end

users the information they want, the way they want it.

The integrated CASE environment from Software AG. Because tomorrow's promises can't solve your problems today. For more information, call 1-800-843-9534. (In Virginia, call 703-860-5050; in Canada, call 519-622-0889.)

Your success is how we measure ours.



\*U.S. factory-based price only. UNIX is a registered trademark of AT&T in the U.S.A. and in other countries. U.S. factory-based price includes CPU, 4 Mbyte of memory, 15-inch monochrome monitor, and a





# How to give your group







# everyone in a workstation.







### The new Apollo Series 2500. Only \$3990.

Everyone on your team needs a workstation. But not everyone can have one. They simply cost too much.

Hewlett-Packard has a better way.

The extraordinary Apollo Series 2500. As the industry's lowest-priced work-

station, it offers the same features as workstations that cost thousands more. 4 MIPS of UNIX\* system performance. Highresolution graphics. And almost unlimited possibilities for standards-based networking.

All for only \$3990.\*

Hewlett-Packard can offer inspired solutions

for all your team computing needs. To find out more, call 1-800-752-0900, Ext. 283C.

There is a better way.



HEWLETT PACKARD

### **ADVANCED TECHNOLOGY**

### Modular model of future health care

Heart of Andersen's Hospital of the Future is a decentralized computing structure

BY ELLIS BOOKER CW STAFF

he hospital of the future will not include robotic nurses in white outfits dispensing pink pills to feverish patients. At least that won't be the case in hospitals automated by Andersen Consulting.

Two weeks ago in Dallas, Andersen opened its "Hospital of the Future," a permanent exhibit and research laboratory intended to demonstrate how some 20 vendors of clinical and administrative hospital systems can be tied together through networks and standard interfaces.

Like Chicago-based Andersen's other two integration exhibits — the \$1.4 billion information systems consulting giant has similar centers for the manufacturing and retail industries — the \$7 million hospital exhibit rests squarely on a belief in distributed computing.

Monolithic, mainframe-based hospital information systems, Andersen officials suggested, are going the way of the glass-enclosed data center; it is an approach to automation being made obsolete by cheaper, more flexible departmental and workstation computer platforms linked via localarea networks.

#### **Decentralization devotees**

So dedicated is the exhibit to the decentralized approach that it curiously does not include a connection to an IBM mainframe. Andersen officials said a "back-end" link to a Systems Network Architecture host is being considered.

"Hospitals are at a critical crossroads," said Jay E. Toole, Andersen's worldwide industry director for the health care consulting practice. He said new reimbursement structures, increasingly cost-conscious corporate payers, a skilled labor shortage and plain old competition have put hospitals nationwide on a crash course to improve their procedures - from the quality and speed of their billing systems to the quality and speed of their surgical teams.

However, Toole noted that hospitals are still behind other industries when it comes to investing in IS, typically spending approximately 3% of their annual operating budget — far less than the 8% to 10% spent by banks and insurance companies — on information technology.

"We think that for another 1% or 2% over the next few years, [hospitals] can begin to put in an architecture," Toole said.

Such a modular, distributed approach to hospital IS, Andersen argued, is a cheaper way to solve productivity and quality concerns because it allows each department to



deploy the best system available.

Technologies on display in the exhibit include home medical monitoring systems; handheld terminals for nurses; voice- and handwriting-recognition systems; communications gateways enabling physicians outside the hospital to check a patient's medical database via Integrated Services Digital Network telephone lines; high-speed fiber-based LANs for transmitting diagnosis-quality radiological images; smart cards able to store a patient's medical and insurance history on a microchip; and executive information systems for the hospital's management team.

Until now, however, the expense of writing interfaces between different vendors' medical IS has been prohibitively expensive. Enter Health Level 7, or HL7, an emerging application-level protocol that makes writing interfaces between different systems much easier (see story below). Nine of the 16 applications in the Andersen exhibit adhere to HL7, and Andersen officials said that in the coming months, most of leading hospital systems vendors will have an HL7 interface.

Connecting the HL7 programs was Symborg Systems' Stat Lan, a message referee for HL7 systems. The LAN runs over the Ungermann-Bass, Inc. implementation of the Xerox Network Systems protocol on a twisted-pair Ethernet.

To deliver a common interface among the remaining non-HL7 systems, Andersen used a terminal-emulation and user interface product from NCR Corp. called Access 2000. The software, running on an Unixbased NCR Tower Model 32/700 supermicrocomputer, connects HL7 and non-HL7 systems over a Transmission Control Protocol/Internet Protocol Ethernet network.

Throughout the exhibit, the user

interface was graphical, in effect shielding the physician, nurse or hospital administrator from the fact that the information on the screen was being pulled from several databases throughout the hospital. One of the most interesting demonstrations of a graphical user interface was a "medical chart," an Apple Computer, Inc. Hypercard application that physicians outside a hospital can access from their remote workstation.

Attendees at a technology conference at the Infomart in Dallas sponsored by the The American College of Healthcare Executives, which will be the executive sponsor for the exhibit during the next three years, got a tour of the Andersen exhibit, and many said they were impressed.

However, many of these executives said they still worried about the ease with which different systems can be interfaced and, importantly, how they will be *synchronized* in the absence of a centralized database.

"If hospitals had to do it all over, they might use a core system approach," said Edward J. Pastor, IS director at Swedish American Hospital in Rockford, Ill. But for most institutions, he said, that is not an option, and they face the dilemma of integrating clinical department systems with the patient records and financial systems that have been purchased over the years.

For Executive Vice-President William Heath at Saginaw General Hospital in Saginaw, Mich., centralization was the answer. The 350-bed hospital is moving to upgrade its IBM 4341 to a 4381 and at the same time install a commercially available core system with departmental modules over the next 18 months. Even so, Heath is concerned about adding future clinical components, such as an electronic medical record. "Chances are we'll use another vendor . . . and I hope we'll be able to interface easily," he said.

### United against incompatibility

ealth Level 7, better known as HL7, was pital information systems users tired of the incompatibilities of their clinical and administrative computer systems.

The IS users banded together in 1987 — later adding hardware and software vendors and consultants to their ranks — to develop an open-architecture model for transmitting information between computer sys-

The current implementation of HL7 Version 2.0, was demonstrated in February 1989 at the American Hospital Association's Healthcare Information Management Systems Society conference in Anaheim, Calif. That demonstration linked the applications from seven vendors, all on different hardware platforms.

Andersen Consulting, which served as systems integrator on that demonstration, is a founding member of the group known as the Health Level Seven Standards Committee.

HL7 Version 3.0, due out later this year, will adorn out of the frustration of a group of hos- dress other areas of the hospital, notably the financial and inventory systems, as well as expanded coverage of nursing and pharmacy systems.

> Because it is application-level protocol — corresponding to the seventh and top layer of the Open Systems Interconnect protocol — HL7 is network-independent and computer architecture-independent. It defines the content and format of electronic messages, but not the network or computer architecture carrying those messages.

> One of the most powerful aspects of the standard and a critical feature for distributed environments — is HL7's definition of various trigger events to automatically update various databases throughout the institution. For example, after a new patient is logged into the patient admissions system, pertinent parts of the patient's medical biography will be sent to the laboratory and radiology systems.

> > **ELLIS BOOKER**

Meet the #1 Software for a Growing Family

The more you rely on the expanding family of VAX™ computers, the more you need the SAS® System—the leading data analysis and graphics software in the VAX market. No other software has the power and flexibility to handle *all* your data management, analysis, and presentation needs. Across the entire range of VAX systems.

The SAS System brings you more choices for data entry, retrieval, and management... report writing and graphics... statistical and mathematical analysis (including quality control)...business planning, forecasting, and decision support...operations research and project management...and applications development. All fully integrated. All backed by VMS-specific technical support, training, and documentation.

Page Fault Types over Time

And now we've extended the family with specialized tools for evaluating VAX computer performance, as well as interfaces to popular data bases such as ORACLE® and Rdb™. No wonder experts call the SAS System "...perhaps the most sophisticated and versatile family of products on the market."\*

### Yours for 30 days...FREE

Find out why the SAS System is the software you won't outgrow. Ask for our free 12-page executive summary and details about a free 30-day software evaluation. Call us today at (919) 677-8200. In Canada, call (416) 443-9811.

The SAS° System.

More Choices
for More Applications
than Any Other Software.

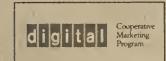
\*Digital Review. Reprint available.

The SAS System runs on the entire family of VAX minicomputers and workstations under VMS.

Mainframes, personal computers, and UNIX-based workstations from other vendors are also supported.

SAS is a registered trademark of SAS Institute Inc. VAX, VMS, and VAX Rdb/VMS are trademarks of Digital Equipment Corp., and ORACLE is a registered trademark of Oracle Corp.

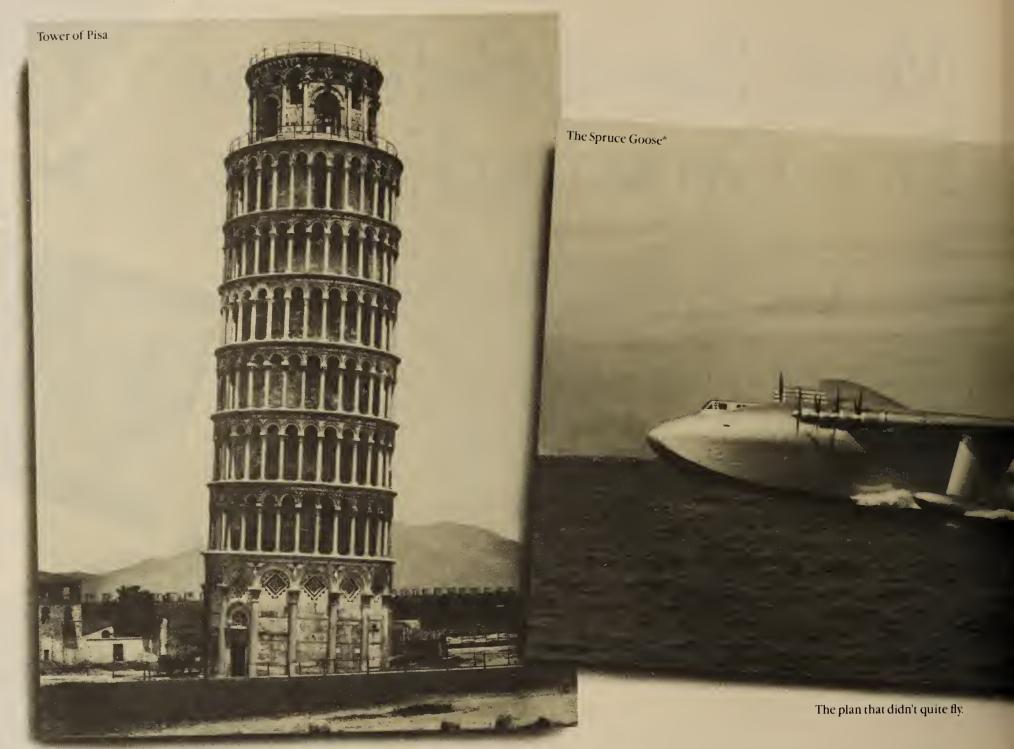
Copyright © 1989 by SAS Institute Inc. Printed in the USA.





SAS Institute Inc. SAS Circle ☐ Box 8000 Cary, NC 27512-8000 Phone (919) 677-8200 Fax (919) 677-8123

U.S. Direct Investment Position



The plan that couldn't stand on its own.

# Unfortunately, not all as well as the AT&T MEGA

### And now it'll pay offeven more by saving you at least \$900 a year.

Did you know the AT&T *MEGACOM* WATS Term Plan can save you \$900 a year or more on outbound domestic calls. That's along with the 40% discount you're already receiving as a *MEGACOM* WATS customer.\* Plus you'll get extra savings on international calls.

The Term Plan is so flexible that in most cases should your bill fluctuate by season, you can still save. Numerous discounts are available to suit your level of usage. You can

begin saving with an average monthly bill as low as \$2,500. You also have the option of choosing an 18- or 36-month plan. Plus, for a limited time, we'll even waive the monthly service charge.

And if you're not currently using AT&T *MEGACOM* WATS, we'll also pay the installation and start-up fees.\*\* But you don't have to wait for installation to start saving.

Savings start as soon as your order is placed.

If you're with another company, we'll also pay the majority of the switchover fees. And if after 180 days you're not fully satisfied, we'll even pay to switch you back. With

<sup>© 1990</sup> AT&T

<sup>\*</sup>Discounts on average as compared to AT&T basic interstate service for a typical business call. Actual savings will vary according to calling patterns.
\*\*Central Office Connection and Central Office Function charges not included in waiver offer.



### plans have paid off COM® WATS Term Plan.

that kind of satisfaction guarantee, you just, can't go wrong.

So sign up now. You couldn't pick a more foolproof plan.

Offer expires October 9,1990. Installation needed by December 10,1990.

### AT&T MEGACOM WATS Term Plan. Another AT&T advantage.

Act now and take advantage of our free trial offer on AT&T Card EXECU-BILL™ service—a management tool for controlling card costs.

For more information, please call your

Account Executive or 1800 247-1212, Ext. 571.



### **EDITORIAL**

### Thumbs...up?

HERE'S A CAUTIOUS but distinct air of optimism circulating about the computer industry these days. Exactly why, we're not really sure.

More and more computer vendors are popping up on stock analysts' "buy" lists. The semiconductor associations are reporting order numbers that are being interpreted as a harbinger of better times just over the horizon. And earlier this month, IBM sounded a very optimistic note about business expectations.

Unfortunately, a look at the dynamics underlying user purchase decisions yields little reason to think any big changes in the U.S. market are forthcoming. Believe it or not, this could be good news for these users.

First of all, the general state of the economy is shaky. Unbelievable as it may sound, the "T" word is almost audible on the lips of President Bush. A continued inability to cut the defense budget makes new federal taxes almost inevitable for the federal government to meet mandated budget guidelines. Some state governments, too, are on the verge of significant tax increases, largely because of several years of federal aid cutbacks. Taxes do not walk hand in hand with economic growth and capital spending.

The inability of our education system to churn out enough qualified professionals is already putting upward pressure on the prime determinant of inflation — wage rates. Wage inflation and economic growth are also strange bedfellows.

Both the people for whom information systems services are provided (the user departments) and those who ultimately approve expenditures for IS outlays (corporate management) are increasingly questioning whether they are getting their money's worth. In separate studies of both groups conducted by *Computerworld*, only half the user department managers felt their companies have gotten good value for their IS expenditures; the corporate managers surveyed were even less convinced that they got their money's worth. These sentiments do not necessarily make for a favorable buying climate.

Yes, it's a dismal science — but not totally, because aggressive, continued price cutting is the only thing worth banking on at this point.

### A chill wind

urely Robert T. Morris' sentence is a chilling reality for those people whose jobs depend on the security of the systems they maintain. These managers know that any system can be compromised, just as any bank can be robbed. We are left with a situation in which hacking that results in costly damage is punished selectively at best and, in a case like the Internet attack, almost not at all.

At least the bank president knows that the courts stand ready to provide some measure of deterrence when a convicted robber faces the bench for sentencing.



### LETTERS TO THE EDITOR

### **The Promised LAN**

As an information systems professional, I am offended by your cover article "LANscape laced with minefields" [CW, April 23] and past articles which are constantly prone to LAN-bashing.

What it all boils down to is dollars. LANs have taken a major chunk of the IS market by storm, and LANs have been a catalyst to the IS community, spurring vendors to build a better mousetrap (which is the American way). Computerworld continues to perpetuate the myth regarding LANs. Confusion is what we need least in the IS community. The LAN Of Opportunity is large and all-encompassing; LANs are still in their infancy, but we are not far from the Promised LAN. Lighten up on LANs.

Timothy A. Rollins President The Rollins Group Los Angeles

### Mythconceptions

I believe your article "Myth of the elite programmer" [CW, April 9] comes to certain inaccurate conclusions.

National information systems recruiting professionals have found that few people are hired because they know C or Cobol in a particular technology environment; instead, clients ask us to locate people who know Unix and C or MVS and Cobol and have used those skills to support a specific application or product development. Once you take this more realistic measure into account, we discover that few mainframe programmer/analysts earn more than \$55,000, while there are certainly many working with C who earn in excess of that amount.

C programmers are also more highly paid for less chronological experience than are those with mainframe experience.

What is true is that firms want to hire specialists who have experience with their type of technology environment and their type of business or product environment. They will continue to do so throughout the 1990s, as a way of coping with the extreme labor shortages American industry is facing.

Jeff Altman President Jeff Altman & Co. New York

### Coverage costs

In a recent article on viruses, "Health insurance for computers" [CW, April 23], I was quoted as stating that the current available limit of virus-specific insurance is "about \$100,000." This figure is applicable to only one of the handful of insurance carriers offering policies that include damage from viruses as a covered peril. Theoretically, it is possible to obtain a minimum of four or five times that amount in limits. In practice, obtaining an adequate level of coverage depends on the level of understanding and communication among the entity applying for coverage, the entity's insurance broker and the underwriter.

> John C. Lamberson San Jose, Calif.

### Paper view

In "EFT: If money could talk . . . " [CW, March 26], Bill Brandel said: "A company can send it by paper, a third-party network, the ACH . . . " No way! The whole point of electronic data interchange is not to send it by pa-

per. That obviates the crux and theme of EDI.

Perhaps to clarify this point, it would do well to give a definition of EDI. Usually, such definitions suggest that EDI is "electronic exchange of computer-processable data in standard form." Thus, paper, faxes and electronic mail do not qualify as EDI, as they are neither machine-processable nor in standard format, and paper is not electronic.

The article also suggested that the automated clearing-house (ACH) network was originally structured for banks to exchange funds among themselves. It has been my understanding that the purpose of the ACH was to establish an electronic counterpart to the existing check settlement system. The ACH sorts checks by exchange of electronic records, not sorted paper stacks.

Regarding the Corporate Trade Exchange (CTX) format of ACH, it is my understanding that the addendum record has been expanded to include and contains the EDI X12 remittance/payment advice protocol. The CTX addenda has more than 9,900 character records. That's a pretty large addenda to a payee that you are advising about taking a discount or paying partially.

Louis Hochstaedter President High City International, Inc. Novato, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.

### Project development subtleties

WILLIAM DUNCAN



There seems to be a malicious rumor spreading through software development circles that project

management and project methodology are one and the same.

Why is it important to recognize the distinction between the two disciplines? Because the failure to recognize and accommodate the difference remains a leading cause of project failure.

A project methodology, or more accurately, a systems development methodology, defines the strategies that the organization will follow when developing software. For many, the choice of a methodology is akin to the choice of a religion — there is only one true way.

Some preach the gospel of highly detailed methodologies. They distribute thick volumes of forms to document everything from a user interview to a technical walk-through. Some decry the depersonalization of formal structures and worship prototyping or rely upon divine guidance from a techno-guru or two.

Project management seldom inspires such passions. It is,

Duncan is president of Duncan Associates, a project management consulting firm based in Lexington, Mass.

quite simply, the process of converting the strategies defined by the methodology into an operational plan to guide the conduct of day-to-day project activities.

For example, in most methodologies, "identify and interview key users" is a critical success factor. If your methodology calls for such interviews, project management tools and techniques will help you implement that strategy by answering the following questions:

- Who is responsible for developing and approving the list of key users?
- Are there enough analysts available to do the interviews?
- If the interviews take longer than originally planned, what implications does that hold for cost and schedule performance?

Admittedly, there is some overlap between the two. Many methodologies provide some guidance on the most obvious project management issues. Delivering a system that conforms to the specifications is a key objective of both project management and most methodologies.

Given the overlaps, why not just merge the two disciplines into one? Let me illustrate why not with two case histories.

In the first instance, I recently heard a presentation by a senior manager at one of the best known information technology consulting firms. He noted that many companies were losing

substantial chunks of market share to more nimble competitors because of their inability to develop mission-critical systems in a timely fashion.

Part of the problem, he said,

adherence to detailed plans — even when the plans clearly are no longer appropriate.

If he had made a clear distinction between project methodology and project management, he could have used the strengths of the latter to counter the weaknesses of the former. Good project management can make even



Bob Dahn

was that we needed a "whole new approach to project management." But the problems he described were those of highly structured traditional *methodologies* that equate the quantity of forms with the quality of the system and that mandate slavish the most rigid methodology more flexible by helping to identify appropriate trade-offs between cost, schedule and technical performance.

In the second case, I saw an article about "prototyping as a project management tech-

nique." I had to read it twice, however, before I understood that the author's definition of a project management technique was "anything that will get the job done quicker."

However, prototyping has nothing to do with project management. Whether you prototype or use a more traditional methodology, you still need project management to help estimate and schedule the time of the people creating the software. Regardless of the methodology, good project management will help get the project done on time by improving resource allocation decisions and by anticipating and avoiding problems that could cause delays.

In both cases, by confusing project management with project methodology, experienced software developers cut themselves off from a body of knowledge that can help them respond to the demands of today's information technology environment.

By failing to use all the tools at our disposal, we court disaster. Every software professional has a favorite horror story about a system that was months or even years late — or one that was so full of bugs it was virtually unusable. How many of these problems were caused by weak methodologies? How many by poor project management?

Are you willing to risk failure on a mission-critical software product? If not, it might pay to examine your project methodology and your project management independently.

## Justice failed in refusing to make Morris an example

MICHAEL ALEXANDER



Suppose Robert T. Morris had stolen a bicycle and rode across the country, periodically stopping to try the

doorknobs of houses at random. Whenever he found an unlocked door, he would wheel the bike into the house and ride around while the homeowners slept. Suppose later he said that he meant no harm even though thousands of homeowners woke up the next morning to find their front and back doors ajar and muddy tire tracks across their floors and carpets.

Would Morris have gone to jail? You bet.

That is basically what Morris did the evening of Nov. 2, 1988. But Morris isn't going to spend one night in jail, even though jail time is what he deserves. As he admitted on the witness stand

Alexander is *Computerworld's* senior editor, advanced technology.

during his trial in January, Morris created a worm program and intended to deposit a copy of it in as many computers as possible on Internet. A programming error caused the program to replicate out of control, he said.

He didn't mean any harm, one of his lawyers told the judge. This boy is basically honest and did not act out of malice, the other lawyer said. His act was reckless, irresponsible and stupid, but he should not be incarcerated, they pleaded only minutes before sentencing last week.

The U.S. Justice Department, which had been divided on how to prosecute this case from the day it happened, backed off at the last minute and opted not to recommend sentencing, as it usually does. Federal prosecutors told the judge that although the government was unable to recommend an appropriate sentence, "some period of incarceration would be warranted."

The judge, an admitted technophobe, apparently bought into the notion that Morris was merely a modern-day sorcerer's

apprentice who played with the boss' magic wand without permission.

Immediately before sentencing, the judge said that he had no legal precedent to follow and that the penalties for traditional crimes such as trespassing just did not fit this case. Then he sentenced the ex-Cornell University graduate student to a three-year probation, fined him \$10,000 and ordered him to do 400 hours of community service.

Later, outside the courtroom, the defense lawyers said they hope Morris will spend his 400 hours of community service applying his computer talents. To me that seems like allowing an arsonist to install smoke detectors.

Lost opportunity

Compared with rape, murder and major-league drug dealing, this crime is small potatoes. It is easy to understand why a judge might be reluctant to put Morris in jail. Even so, the courts missed their biggest opportunity thus far to send a message to "wannabe" outlaw hackers.

Morris' lawyers argued that it would not have been fair to make an example or symbol out of him. I maintain that you have to draw the line on computer crime

somewhere, and "somewhere" was in a federal district court in Syracuse, N.Y., last week.

No sentence, no matter how severe, will deter outlaw hackers, but there are plenty of youngsters who may be headed in the wrong direction that could conceivably have been induced to stay on the straight and narrow by making an example of Morris.

Take the case of the 12-yearold boy in Michigan who was arrested a couple of weeks ago for breaking into a TRW computer and stealing credit-card numbers, which he gave to fellow cyberpunks to charge merchandise illegally. Kids like that apparently have no idea that hacking into computers is wrong, mainly because they see others get away with it every day.

While it is too late to keep that particular kid out of trouble, a sharper response by the courts would have sent a stern warning to other potential outlaw hackers while they are still impressionable and able to learn a lesson or two.

Hackers all over the country are getting off with a slap on the wrist or less. The rest of us, like those hypothetical homeowners, are left to clean up the mess.

You should believe that the

problem of computer fraud and abuse will get worse in the years ahead. Already, computer viruses are proliferating astronomically, and while there are no reliable figures available, the losses must certainly amount to millions of dollars per year.

It is going to take a whole new attitude about computer crime if we are to have even the remotest prospect of coping with it. We are also in desperate need of new remedies to combat computer crime, and those remedies should include jail time in many instances. A clear-sighted superior court judge in Arizona, for example, recently sentenced a hacker who had stolen telephone access codes to 20 days in jail in 10 two-day blocks so as not to interfere with his employment. The hacker was also fined \$5,000 and prohibited from using computers except as required under supervised legitimate employment for the duration of his three-year probation.

Morris should have gotten a sentence with similar provisions.

Instead, the judge and, to some extent, the Justice Department failed to lay a cornerstone in a foundation on which the country can build a workable set of laws aimed at combating computer crime.



1990-A YEAR FOR RESULTS

Only one Financial & HR Solutions Conference brings together 5 of the country's leading corporations to show you how DB2, SAA and workstation

applications get you bottom line results.

Walker, Tesseract, Price Waterhouse, Microsoft and IBM present the Third Annual Financial & HR Solutions Conference.

1990 is the year for results. You demand them. We will show you proven business applications that deliver them.

This conference will give you a real depth of knowledge and breadth of integrated working solutions with demonstrations of the newest technology available today.

Why you should choose this one day conference:

• Current directions for DB2 and SAA. IBM will talk with you about DB2 and SAA strategies and will address the role of the workstation—the window to your enterprise.

• The broad spectrum of DB2 and workstation applications available today. They include such Financial and Human Resource applications as:

General Ledger Flex Benefits
Accounts Payable Payroll

Purchasing Personnel Management

- Conversion to DB2. Hear from experts about new tools and methodologies that help you to efficiently convert your existing applications from other environments to DB2.
- ◆ Learn how Microsoft Excel for OS/2, the most powerful spreadsheet available, can be used with DB2, HR, and financial data under OfficeVision. And just for attending receive free a fully functioning Working Model of Microsoft Excel for OS/2.

IBM, DB2, SAA, and OS/2 are trademarks of the IBM Corporation.

### Conference Schedule

Atlanta + 2h Cleveland 5 8 Houston 5 10 New York + 19 Toronto 5 15 Boston 4 5 Dallas 3 27 Los Angeles 1 24 Philadelphia 4/3 Washington, DC 3 21 Chimpro 3 20 Datrott 5 3 Winnerpolis 5 1 Sup Francisco 5 17

Register now to ensure your FREE reservation. Space in each city is LIMITED. Call (415) 495-8866 TODAY or fax (415) 543-6338. Or write:

C/o Walker Interactive Systems, Marathon Plaza 3 North, 303 Second Street, San Francisco, CA 94107

URGENT	MESSA	GE
TO New Sub	scribers	,
FROM Compute	rwoold	
DATE Today	TIME 9:	00 A.H.
Important	Return Card	
Subscribe Today!	Telephoned	
Answer Questions	✓ Save 57% (	Off Cover
0		0 1 1
MESSAGE Save	money.	yet 51
issues of Co	moutahur	Ald for
20 HILL 00	*1	0
only + 44.00	· /	
U		
Name	T	itle
Company		······································
Company		
Address		
Address	State	Zip
Address		
Address  City  Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)	ions to qualify for to 23. Dir/Mgr Sys. E 31. Mgrs , Suprix o	his rate.  evelopment, Sys. Architecture I Programming, Software Dev.
Address  Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/insurance/Real Estate	23. Dir/Mgr Sys. E 31. Mgrs, Suprv o 32. Programmers, 50. Sys. Integration	evelopment, Sys. Architecture Programming, Software Dev. Software Developers UVARS/CONSULTion Mil.
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estete 30. Medicine/Law/Education 40. Wholosate/Relatul/Tade	23. Dir/Mgr Sys. E 31. Mgrs , Suprv o 32. Programmers, 50. Sys. Integration OTHER COMPANY	evelopment, Sys. Architecture Programming, Software Dev. Software Developers VAMAS/Consulting Mgt. MANAGEMENT
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate 30. Medicine/Law/Education 40. Wholosale/Relatil/Tade 50. Business Service (except DP) 50. Government - State/Federal/Local	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Over 12. Vice President,	nis rate.  evelopment, Sys. Architecture Programming, Software Dev. Software Developers VARAS/Consulting Mgt. MANACE MENT er/Partner, General Mgr. Asst. VP.
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate 30. Medicine/Law/Education 40. Wholosale/Retail/Trade 50. Business Service (except DP) 50. Coverment - Stale/Federal/Local 55. Communications Systems/Public Utilities/ Transportation	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Tressurer, Con. S	revelopment, Sys. Architecture Programming, Software Dev. Software Developers VAMAS/Consulting Mgr. MANACEMENT er/Partner, General Mgr. Asst. VP rottler, Frinancial Officer pentific, R80, Tech. Mgt.
Please answer quest  Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)  20. Finance/Insurance/Real Estete  30. Medicine/Law/Education  40. Wholosale/Reals/I/Tade  50. Business Service (except DP)  50. Communications Systems/Public Utilities/  Transportation  7. Mining/Construction/Petroleum/Refining/Agric.	23. Dir.Mgr Sys. E 31. Mgrs., Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Owr 12. Vice President, Owr 13. Treasure, Cont 41. Engineering, S. 51. Sales & Mkta.	evelopment, Sys. Architecture Programming, Software Dev. Software Developers Software Developers MANACE STREET MAN
Please answer quest  Please answer quest  Business/industry (circle one)  10. Marufacturer (other than computer)  20. Finance/Insurance/Real Estete  30. Medicine/Law/Education  40. Wholosale/Relail/Tade  50. Business Service (except DP)  50. Government - State/Federal/Local  55. Communications Systems/Public Utilities/ Transportation  70. Mining/Construction/Petroleum/Refining/Agric.  50. Manufacturer of Computers, Computer-Related  Systems or Perioberals	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Treasurer, Cont 41. Engmeering, S 51. Sales & Miktg. I OTHER PROFESS 70. Medical, Legal	evelopment, Sys. Architecture   Programming, Software Dev. Software Developers   VARIS/Consulting Mgt.   MANAGEMENT   er/Partner, General Mgr.   Asst. VP.   Other Financial Officer   Other Financial O
Please answer quest  Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Marufacturer (other than computer)  20. Finance/Insurance/Real Estete  30. Medicine/Law/Education  40. Wholesale/Retail/Trace  50. Business Servica (except DP)  50. Government - Staale/Federal/Local  50. Communications Systems/Public Utilities/  Yansportation  70. Mining/Construction/Petroleum/Refining/Agric.  50. Manufacturer of Computers, Computer-Related  Systems or Peripharals  50. System Integrators, WARs, Computer Service  Burseaus, Software Planning & Consulting Services	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Treasurer, Cont 41. Engmeering, S 51. Sales & Miktg. I OTHER PROFESS 70. Medical, Legal	evelopment, Sys. Architecture Programming, Software Dev. Software Developers UVARIS/Consulting Mgt. MANAGE MRTN er/Partner, General Mgr. Assl. VP. Understein, RåD, Tech. Mgt. Aanagement DNALS Accounting Mgt. aliests, Librarians, Students
Please answer quest  Please answer quest  Business/industray (Circle one)  10. Marufacturer (other than computer)  20. Finance/insurance/Real Estete  30. Medicine/Law/Education  40. Wholesale/Retail/Table  50. Business servica (except DP)  50. Government - Staale/Federal/Local  50. Communications Systems/Public Utilities/  Yansportation  70. Mining/Construction/Petroleum/Refining/Agric.  50. Manufacturer of Computers, Computer-Related  Systems or Peripherals  51. System Integrators, WARs, Computer Service  52. Bursaus, Software Planning & Consulting Services  60. Computer/Peripheral Dealer/Distr/Retailer  75. User: Other	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Our 12. Vice President, 13. Treasurer, Cont 41. Engineering, S 51. Sales & Mktg. OTHER PROFES 70. Medical, Legal 56. Educato, Jegal	evelopment, Sys. Architecture   Programming, Software Dev. Software Developers   VARIS/Consulting Mgt.   MANAGEMENT   er/Partner, General Mgr.   Asst. VP.   Other Financial Officer   Other Financial O
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Industrace/Real Estate 30. Medicine/Law/Education 40. Wholosate/Retail/Tisde 50. Business Service (accept DP) 50. Government - Stale/Federal/Local 55. Communications Systems/Public Utilities/ Transportation 70. Minimp/Construction/Perroleum/Refining/Agric. 50. Manufacturer of Computers, Computer-Related Systems or Peripherals 51. System Integrators, VARs, Computer Service 80. Computer/Peripheral Consulting Services 80. Computer/Peripheral Dealer/fibsir/Retailer 75. User Other	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Tressurst, Cont. 41. Engineering, S 51. Seles & Mitg. OTHER PROFESS 70. Medical, Legil 56. Educator, Jour 90. Othera	evelopment, Sys. Architecture Programming, Software Development Software Developers (VARAS/Consulting Mgt. MANAGE MENT or/Partner, General Mgr. Asst. VP orlier, Financial Officer pentific, R&D, Tech. Mgt. danagement ONALS Accounting Mgt. aliets, Libramans, Students (Please specify)
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate 30. Medicine/Law/Education 40. Wholosale/Relatul/Tace/ 50. Governmen' - State/Federal/Local 55. Communications Systems/Public Utilities/ Transportation 70. Mining/Construction/Petroleum/Refining/Agric. 80. Manufacture of Computer, Computer-Related Systems or Peripherals 8. System Integrators, VARs, Computer Service 80. Supsiem Integrators, VARs, Computer Service 80. Computer/Peripheral Dealer/(Distr/Retailer 75. User Other 85. Vendor Other (Please specify)	23. Dir/Mgr Sys. E 31. Mgrs, Supr. to 32. Programmers, 50. Sys. Integration THER COMPANY 11. President, Own 12. Vice President, 13. Treasurer, Cont. 41. Engineering. S 51. Seles & Mittg. O'THER PROFES 70. Medical, Legal 56. Educator, Journ 90. Othera	revelopment, Sys. Architecture Programming, Software Dev. Software Developers VVARAS/Consulting Mgt. MANAGE MENT  Or/Partner, General Mgr. Asst. VP  oritler, Financial Officer inentific, R&D, Tech. Mgt. Asnagement  ONALS  Accounting Mgt. aliets, Librarians, Students  (Please specify)  VEMENT (Circle all that apply)
BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)  20. Finance/Insurance/Real Estate  30. Medicine/Law/Education  40. Wholesale/Retail/Trade  50. Business Servica (except DP)  50. Government - State/Federal/Local  50. Communications Systems-Public Utilities/ Transportation  70. Mining/Construction/Petroleum/Refining/Agric.  80. Manufacturer of Computers, Computer-Related Systems or Peripherals  55. System Integrators, VARs, Computer Service  80. Computer/Peripheral Dealer/Distr/Retailer  75. User-Orthor  (Please specify)	23. Dir/Mgr Sys. E 31. Mgrs., Supr. o 32. Programmers, 80. Sys. Integration OTHER COMPANY 11. President, Own 12. Tresident, Own 13. Tresident, Own 14. Engineering, S 51. Sales & Mktg 0THER PROFESS 70. Medical, Logid 50. Educator, Journ 90. Others 3. COMPUTER INVO	evelopment, Sys. Architecture Programming, Software Development Software Developers (VARAS/Consulting Mgt. MANAGE MENT or/Partner, General Mgr. Asst. VP orlier, Financial Officer pentific, R&D, Tech. Mgt. danagement ONALS Accounting Mgt. aliets, Libramans, Students (Please specify)
Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)  20. Finance/Insurance/Real Estate  30. Medicine/Law/Education  40. Wholesaler/Relaul/Trace  50. Losiness Service (avcept DP)  50. Communications Systems/Public Utilities/ Transportation  70. Mining/Construction/Petroleum/Refining/Agric.  50. Manufacturer of Computers, Computer-Related Systems or Peripherals  51. System Integrators, VARs, Computer Service  52. Descriptions  53. User: Other  65. User: Other  65. User: Other  66. User: Other  67. User: Other  67. User: Other  68. System (Petipherals)  68. Userdor Other  68. Wendor Other  69. (Please specify)	23. Dir/Mgr Sys. E 31. Mgrs., Supr. o 32. Programmers, 80. Sys. Integration OTHER COMPANY 11. President, Own 12. Tresident, Com 13. Tresident, Com 14. Engineering, S 51. Sales & Mktg. OTHER PROFESS 70. Medical, Legig 80. Educator, Journ 90. Others  3. COMPUTER INVO T, and a sprand implement of the sprand implement of	evelopment, Sys. Architecture Programming, Software Dev. Software Developers IVAPISC consulting Mgt. MANAGE MERT MANAGE MERT Asst. True, General Mgr. (Please specify)  VEMENT (Circle all that apply) with with the large asst. In the consultant. permints
Please answer quest  BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/insurance/Real Estate 30. Medicine/Law/Education 40. Wholosale/Retail/Tisde 50. Government - State/Federal/Local 55. Communications Systems/Public Utilities/ Transportation 70. Mining/Construction/Petroleum/Refining/Agric. 50. Manufacturer of Computer, Computer-Related Systems or Peripherals 5. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services 90. Computer Peripheral Dealer/Distr/Retailer 75. User Other 55. Vendor Other (Please specify) 117.65 FOR TRUE (Circle one) 18/MINS/DP MANAGEMENT 19. Chief Information Officer/Vice President/Asst. VP 18/MINS/DP MANAGEMENT 19. Chief Information Officer/Vice President/Asst. VP 18/MINS/DP MANAGEMENT	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 80. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Enter & Mgr. 25. Sept. of Sys. of	evelopment, Sys. Architecture Programming Software Devisionware Developers OVARISCONSULING Mgt. MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MANAGEMENT MALS MANAGEMENT MALS MANAGEMENT MALS  (Please specify)  VEMENT (Circle all that apply) with wh. b. p. are
City  Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)  20. Finance/insurance/Real Estate  30. Medicine/Law/Education  40. Wholosaise/Retail/Trace  50. Government - State/Federal/Local  51. Communications Systems/Public Utilities/  Transportation  72. Mining/Construction/Petroleum/Refining/Agric.  52. Manufacturer of Computers, Computer-Related Systems or Peripherals  53. System Integrators, VARs, Computer Service  Bureaus, Software Planning & Consulting Services  80. Computer/Peripheral Dealer/Distr/Relatier  75. User/Other  55. Vendor Other  (Please specify)  117. Expressional Control one  18/MIS/DP MANGEMENT  19. Child Information Officer/Vice President/Asst. VP  18/MIS/DP Management  21. Dir/Mgr MIS Services, Information Center  22. Dir/Mgr Ent Planning, Adm. Sycs., Data Comm	23. Dir/Mgr Sys. E 31. Mgrs, Supr. to 32. Programmers, 50. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Tressurer, Cont 41. Engineering, S 51. Sales & Mittgs 170. Medical, Legal 56. Educator, Journ 90. Othera	evelopment, Sys. Architecture Programming Software Development Programming Software Development VARAS/Consulting Mgt. MANAGEMENT  OF Parties, General Mgr. Asst. VP  order, Financial Officer  centric, R&D, Tech. Mgt.  danagement  ONALS.  (Please specify)  VEMENT (Circle all that apply)  with with a ser.  ser. vendor, or consultant.  perminis Software Software  Software Software  Softw
Please answer quest  BUSINESS/INDUSTRY (Circle one)  10. Manufacturer (other than computer)  20. Finance/Insurance/Real Estete  30. Medicine/Law/Education  40. Wholosale/Relaw/Education  40. Wholosale/Relaw/Education  40. Wholosale/Relaw/Education  50. Gusiness Service (avcept DP)  50. Government - State/Federal/Local  50. Communications Systems Public Utilities/ Transportation  70. Mining/Construction/Petroleym/Pefining/Agric.  50. Manufacturer of Computers, Computer-Related Systems or Peripherals  50. System Integrators, WARA, Computer Service  50. Computer/Peripheral Dealer/Distr/Relatier  75. User: Orthor  51. User: Orthor  (Flease apocity)  117. DEFORCTURE/Circle one)  13/MIS/DP MANAGEMENT  14. Chief Index/Mica President/Asset VP.	23. Dir/Mgr Sys. E 31. Mgrs, Supr. o 32. Programmers, 80. Sys. Integration OTHER COMPANY 11. President, Own 12. Vice President, 13. Enter & Mgr. 25. Sept. of Sys. of	evelopment, Sys. Architecture Programming, Software Devisionware Developers (VARIAS Consulting Mgt. MANAGE MERT AMANAGE MENT AMANAGE MENT AMANAGE MENT AMANAGE ME

# **BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

# COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



### SYSTEMS & SOFTWARE

S O F T
T A L K

Jean S. Bozman

### Quality, not quantity



For Oracle, high-speed growth is out; quality is in. That is the new message from both

Chief Executive Officer Larry Ellison and Peter Tierney, senior vice-president of Oracle's Product Division. "We are shifting our priorities toward account management, customer satisfaction and quality," Tierney said of the firm, which has made it a priority to double in size each of the last 10 years.

The fact that Oracle has finally decided to keep its existing customers happy — and to invest time and money to that end — surely comes as a relief to frustrated users, who have been complaining that Oracle support was spotty and insufficient.

Oracle's largest customers are among those most dissatisfied with the firm's affinity toward fast-paced sales of high-ticket items — and its sometimes quirky follow-up. "We find we're dealing with an increasingly sophisticated customer who is willing to make commitments to buy products across his corporation," Tierney said. "But he's saying, 'Your quality has to improve."

Continued on page 34

### IBM, DEC applaud CA'90s

Public endorsement of new architecture lends credibility, comforts users

BY AMY CORTESE CW STAFF

Executives from IBM and Digital Equipment Corp. shared the stage with Computer Associates International, Inc. Chairman Charles Wang moments after Wang publicly endorsed IBM's and DEC's software frameworks at the recent CA '90s announcement. It was a rare joint appearance by high-level executives from the hardware companies.

"This is an historic occasion as the industry works together," said Robert Berland, IBM's director of application solutions. Berland said IBM had been working with CA for two years to facilitate software solutions based on its Systems Application Architecture (SAA), adding that "SAA will be the underpinning to the structure CA and others deliver."

Henry Ancona, vice-president of business and office information systems at DEC, applauded CA for offering users freedom of choice and stressed DEC's strategic development relationship with the Garden City, N.Y., firm.

However, analysts have since downplayed the significance of the IBM and DEC executives' presence at the CA announcement, interpreting it as a show of support for their own respective architectures.

Fighting optimism

"The significance of the two being there was the fact that there was an endorsement of the SAA and [Network Application Support] architectures," maintained Sam Albert, president of the Sam Albert & Associates consulting firm.

However, the credibility lent by the two heavyweights' presence "made most customers feel better," said James Kinder, director of database administration at Automated Data Processing, Inc.

Users have welcomed the CA initiative so far. Murray Informations Systems, a data processing center for Murray Federal Savings and Mortgage in Dallas, uses nearly 50 CA products. Wayne Sadin, vice-president of MIS, said that in the past, CA had been like a "multiheaded hydra, with too many different ways into their products."

However, over the past few years, Sadin said, the company has been moving steadily to fewer interfaces and fewer differentiations between products. He pointed to CA's Activator product, which provides a single point for start-up and installation.

Continued on page 30

## Systems splurge a key in Revco reorganization

BY J. A. SAVAGE CW STAFF

TWINSBURG, Ohio — The officers of Revco D.S., Inc. are betting that one way to bring the company out of a Chapter 11 reorganization and into profitability is to spend big bucks on new computer systems.

Revco, a 1,800-outlet chain of drugstores in 27 states, went into Chapter 11 in July 1988, two years after a management-led leveraged buyout.

To pull itself out of the reorganization, the company decided to flood resources into computer systems — primarily one to pro-

vide a database for its pharmacists, called Prescription Access Link (PAL).

Revco had to get the bankruptcy court's permission to install PAL. "PAL is one of the improvements we are making to ensure that Revco can emerge from Chapter 11 stronger than ever," Revco Chairman Boake Sells said in a statement. Revco has no specific time frame for coming out of Chapter 11, according to a spokeswoman, but its current plan expires July 31.

Revco chose Tandem Computers, Inc.'s new Cyclone mainframe, an on-line transaction processing, fault-tolerant com-

puter. The company was one of the first production users of Tandem's Nonstop SQL database on

a Cyclone, according to Mike Adamson, director of application development at Revco.

While Revco refused to say how much the PAL project cost, the eight-processor Cyclone that the pharmacy chain bought is listed at a price of \$5.25 million.

Adamson said the system is paying for itself because it efficiently bills insurance companies for prescriptions. "It's 10 times better than the old system," he said

The old system consisted of

NEC Corp. Astra minicomputers in each pharmacy to keep localized patient prescription and bill-

ing information.

"The pharmacists were chained to the minicomputer. It took one minute in between screens," Adamson said. He added that the pharmacists were also doing their own system backups and would load rules into the database.

"Besides taking up time, they were lousy at

it," he said.
PAL not only frees up the pharmacists and bills insurance companies more efficiently, its

database checks for drug inter-Continued on page 33



**Sells** looks to PAL for recovery from Chapter 11



### At Lawson, When We Close A Sale, We Begin A Relationship

Many business application software companies lose interest as soon as the ink dries. At Lawson, that's when our relationship begins. Most of our 1200 clients are mid-sized, growing businesses with special needs...companies with lean staffs who must compete with the Fortune 500. Where survival depends on high productivity.

Full-featured Lawson applications offer big-company functionality. Easy to learn—and use. We supply integrated environmental software and CASE tools, too, that can triple DP and end-user productivity.

Standard support includes everything you'd expect. And then some...like LEON<sup>TM</sup>, our online client information network. A wide range of optional support services. And a Client Satisfaction Team with a goal of 100%.

IBM is a trademark of International Business Machines Corporation.
Unisys is a registered trademark of Unisys Corporation. UNIX is a registered trademark of AT&T.

Looking for the best business software solution? Take advantage of our 15 years of experience helping Lawson clients grow — and compete.

Lawson provides accounting, human resources, distribution and retail software to businesses with IBM or Unisys midrange, mainframe and UNIX computers.



For more information, call Sue Weinacht:
612-379-0258
Lawson Associates Inc.
1300 Godward Street, Minneapolis, MN 55413-1764

WHATEVER IT TAKES!

© Lawson Associates Inc. 1990

# Itruns faster. Itruns stronger. Itruns sharper.



# And it runs in the family.



on Trinitron<sup>™</sup>technology has 1280 x 1024 resolution and a refresh rate of 66Hz to make those graphics look even better.

Of course, it also has everything you'd expect from a VAX. Complete compatibility across the line. There's no need to rewrite your software. And more than 7,000 software applications are available immediately.

You also get application integration that is unmatched in the indus-

try. Digital's Network Application Support (NAS) provides the framework for an open computing environment and enables you to share information across your multi-vendor environment. So your computing investments are protected. Users can continue to use the applications they're accustomed to.

And the VMS<sup>™</sup> operating system that runs on all VAX systems gives you reliability comparable to a mainframe. So you know your data is safe.

We think you'll like the new addition to our family. Especially when you see the price. For more information about the VAXstation 3100 SPX call 1-800-343-4040 ext. 350.

Digital has it now.

© Digital Equipment Corporation 1990, The DIGITAL logo, Digital has it now, VAXstation, VAX and VMs are trademarks of Digital Equipment Corporation. Trinitron is a trademark of Sony Corporation. Galaxy image and SAO display program are from The Einstein Observatory Catalog of IPC X-Ray Sources (FITS/CD ROM Version, I January 1990) © copyright 1990 Smithsonian Institution Astrophysical Observatory





# HOW OTHERS SEE THE MACINTOSH-TOMAINFRAME CONNECTION.

When it comes to system integration, you don't have to treat the Mac differently than any other device on your network. Introducing the MacMainFrame Series, the broadest range of Macintosh-to-mainframe connectivity options available.

### MORE CHOICES. MORE SOLUTIONS.

Now, in an integrated set of solutions, local or remote Mac users in Token Ring, SDLC or coax environments can tap centralized information to make every Mac user's desktop more powerful.

MacMainFrame distributes terminal emulation, file transfer, printer emulation and mainframe graphics across a wide variety of networking schemes.

Since it's fully AppleTalk compatible, EtherTalk, Token-Talk and LocalTalk networks are part of the solution, too.

For customization, there's Avatar's Programmer's Toolkit, a full range of Applications Programming Interface (API) tools. For example, Avatar's Hypercard API has been used to develop a front end system to PROFS, IBM's electronic mail system.

### THE MACMAINFRAME DIFFERENCE.

Unlike some Mac-to-mainframe connections, MacMainFrame enhances the benefits of the

### HOW AVATAR SEES IT.

Macintosh user experience.

Since MacMainFrame is completely IBM 3270 compatible, it has no impact on normal mainframe operations. The result? An integrated working environment that increases productivity and reduces headaches.

### SOMETHING ELSE WE SEE. SERVICE.

With eight years of experience, Avatar offers something beyond products and technology. It's called responsiveness. You see, as the 3270 connectivity spe-

cialists, we have helped to integrate Macintosh computers and PC printers into many different environments. Which means we can do the same for you. With a single integrated set of solutions for Token Ring, SDLC, and coax, both standalone and via gateway.

To find out how, call this number toll free at

### 1-800-289-2526.

You'll find that we understand Macintosh-to-mainframe connectivity like no one else. So as your network options continue to grow, Avatar can help you see the forest through the trees.



65 South Street, Hopkinton, MA 01748



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price.

Company	
State Zip	<u> </u>
Basic R	ate: \$48 per year
	State Zip

Please complete the information to the right to qualify for this special rate.

 Manufacturer (other than computer)
 Finance/Insurance/Real Estate
 Medicine/Law/Education Medicine/Law/Educatio
 Wholesale/Retail/Trade 50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation Mining/Construction/Petroleum/Refining/Agric.
Manufacturer of Computers, Computer-Related Systems or Peripherals System Integrators, VARs, Computer Service
 Bureaus, Software Planning & Consulting Services
 Computer/Peripheral Dealer/Distr./Retailer

User: Other 95. Vendor Other (Ptease specify) TITLE/FUNCTION (Circle one) IS/MIS/DP MANAGEMENT Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management IS/MIS/DP Management

21. Dir./Mgr. MIS Services, Information Center

22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources

23. Dir./Mgr. Sys. Development, Sys. Architecture

31. Mgrs., Suprv. of Programming, Software Dev.

32. Programmers, Software Developers

60. Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT

11. President Owner/Partner General Mgr.

Treasurer, Controller, Financial Officer
 Treasurer, Controller, Financial Officer
 Teasurer, Controller, Financial Officer
 Sales & Mktg. Management

70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.

Mainframes/Superminis Minicomputers/Small Business Computers A. B. C. D. Microcomputers/Desktops Communications Systems

Local Area Networks
No Computer Involvement

E4020-X



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price.

First Name		MI		Last Name		_	
Title				Company			
Address		<u> </u>					
City			:	State	Zip		_
ddress Shown:	□ Home	☐ Business			Basic Ra	ate: \$48 per year	

\* U.S. Only, Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S.

Please complete the information to the right to qualify for this special rate.



BUSINESS/INDUSTRY (Circle one) 10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate Medicine/Law/Education
Wholesale/Retail/Trade

Business Service (except DP)

Government - State/Federal/Local Communications Systems/Public Utilities/ Transportation

Transportation
70. Mining/Construction/Petroleum/Refining/Agric
80. Manufacturer of Computers, Computer-Related
Systems or Peripherals
85. System Integrators, VARs, Computer Service
Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr/Retailer
75. User: Other
95. Vendor: Other

(Please specify)

TITLE/FUNCTION (Circle one) IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/Asst. VP

Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
 Dir./Mgr. MIS Services, Information Center
 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
 Dir./Mgr. Sys. Development, Sys. Architecture
 Mgrs., Suprv. of Programming, Software Dev.
 Programmers, Software Developers
 Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT

11. President, Owner/Partner, General Mgr.

12. Vice President, Asst. VP

13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical Lessian

70. Medical, Legal, Accounting Mgt. 80. Educator, Journalists, Librarians, Students 90. Others\_\_\_\_\_\_(Discounting Mgt.

(Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.

Mainframes/Superminis Minicomputers/Small Business Computers

Microcomputers/Desktops

Communications Systems Local Area Networks

No Computer Involvement

E4020-X

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

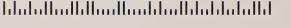
### BUSINESS REPLY MAIL

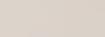
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

### COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144





### **BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

### COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



### Public TV meets up with high-tech IS

### ONSITE

BY MARYFRAN JOHNSON

BOSTON — As sure as green plants grow in The Victory Garden and souffles rise to golden heights for The French Chef. WGBH has turned fund-raising into a high-tech performance.

The Boston-based station is a leading producer of public television programming, boasting one of the largest computer installations in the Public Broadcasting System (PBS) with 500 Apple Computer, Inc. Macintoshes and a Digital Equipment Corp. VAX 8550.

Yet while the Macs are used in the front-line work of word processing, writing and editing scripts, it is the behind-thescenes VAX that serves as the engine for financial data and a massive fund-raising database of 1.5 million records.

"We track lots of information on every donor — data on the amount and type of gift, motivation for giving and whether the pledge came by phone or direct mail," said Mary Meadows, WGBH's director of information systems.

WGBH has served as the finetuner for a database management system from Access International, Inc. in Boston. Access created the system in a marketing partnership with Cambridge, Mass.-based Admins, Inc., using Admins' key product — the Admins/V32 fourth-generation lan-

Access now markets a fundraising system, modeled after the WGBH system, to other public TV stations, nonprofit hospitals and associations.

In 1989, WGBH raised \$15.4 million in donor contributions alone, and its overall budget was heading toward the \$100-million mark, necessitating an upgrade in computing power. "We've only had the VAX for a year, but we'd be in real trouble without it," Meadows said.

The upgrade to an 8550 from two older VAXs — an 11/780 and 11/785 — enabled WGBH to merge its financial and fundraising systems on one machine. A Decserver 550 attached to the single-node Vaxcluster supports about 50 data-entry terminals.

Faithful watchers of public TV — such as the 10 million who regularly tune into Nova — often find fund-raising as unrelenting as the advertising on commercial TV. WGBH now runs three major campaigns per year, and the trend is turning more toward "occasional spots" after a hot show, Meadows noted.

Despite the high-tech spin WGBH puts on fund-raising,

Meadows said, "This is not a real technical place."

Those smiling pledge-takers, for example, are not hunched over terminals, typing in each

Only a dozen or so of the 319 PBS stations nationwide are large enough to even have an IS department, she explained.

"We have three needs," Meadows said. "Our financial system needs to be good, our fund-raising needs to be good,



David Leifer

WGBH's Meadows puts a high-tech spin on fundraising

caller's donation. They write the information, passing the paperwork along to a service bureau for data entry.

However, WGBH is still considered state-of-the-art in public TV fund-raising, with only WNET in New York and PBS headquarters in Washington, D.C., as technological rivals, Meadows pointed out.

and end-user support has to be there for word processing, scripting, corresponding and messaging."

The 11-member IS staff, operating on an \$835,000 annual budget, is sensitive to the volatile nature of its end users. "The production people are busy and creative and not very tolerant of bureaucracy," Meadows said

with a smile. "They work crazy hours."

Her microcomputer service team, for example, tends to do less technical troubleshooting and more consulting work with employees trying to build small databases. Meadows herself has little technical background, leaving behind an art and management major in college to join WGBH 16 years ago as a fundraising assistant.

By the time the station was ready to overhaul its administrative computing in 1985, Meadows was the only one with handson experience in every major user department. A task force was appointed to develop a computing standard for the station. with an eye toward IBM or DEC as the likely choice.

However, a few Macintoshes had won the hearts of the design department, prompting the task force to consider them instead of IBM Personal Computers. "Now we're four years and 500 Macs later," she said.

There is currently little or no interaction between the Macs and the VAX, but by next September, planned modifications to Access' Financial Management and Control System will enable use of the Macs as dumb terminals on the VAX.

"We'll be able to view financial information and also have the ability to download certain sets of financial information," Meadows said.

### Customers consider Cincom to be an oldie but a goodie

BY ROSEMARY HAMILTON

Cincom Systems, Inc. may not be a high-profile giant like its two chief mainframe database rivals, but apparently not all customers believe bigger is better.

"They've been around for many years," said Richard Krejsa, manager of systems programming at Boston Industrial Products, a division of Dana Corp. "With the core products

they have now, I don't feel insecure staying with them at all. I have no problem sleeping at night."

Like Krejsa, several Cincom customers interviewed recently have a long history with the company. They said Cincom has not let them down, and they expect this trend to continue. Furthermore, they support the firm's plans to bring its Supra database management system to other hardware platforms, including personal computers and Unix systems, as well as to deliver a distributed database capability.

Customers also acknowledged that being outside the IBM and Computer Associates International, Inc. camps has its drawbacks. For one thing, Cincom customers do not have a wealth of third-party tools and companion products available for their database environment, as IBM or CA customers do. However, Cincom users said the core database product is strong enough technically that they are willing to make this trade-off.

"Outside of the fact that there aren't people developing tools to go with the database

product, that's the only place I see it coming up short," said Warren Crawford, manager of database services at Mastercard International, Inc.

Crawford said he is particularly interested in Cincom's distributed database strategy, since Mastercard is looking at replacements for the IBM Series/1 it uses at remote locations. Although an evaluation process has not officially begun, the firm will look to Unix-based systems, he said. If Mastercard goes with a Unix system, it could eventually load Supra at regional locations to communicate with the host Supra, he said.

Cooper Energy Services, a di-

vision of Cooper Industries, Inc., is another customer watching Cincom's plans. Cooper plans to install several midrange computers at its plants and would like to install a Supra version at some of these sites, according to software engineer Jim Linkous. It is likely that Cooper will select an NCR Corp. Tower system, although that decision has not been finalized, Linkous said.

"Certainly, we do have some concerns, but we've dealt with Cincom since around 1970," Linkous said. "Cincom through the years seems to stay up with or ahead of the others. We have confidence that they'll stay on the state-of-the-art line.'

On a steep learning curve with DB2? Or have you resorted to a 3GL to get the functionality needed with DB2?

Then discover why the Gartner Group reports, "For new users, preliminary user input indicates that NOMAD/DB2 may provide the most 'friendly,' tightly coupled and integrated 4GL in relation to DB2."

Relational since 1975, NOMAD has consistently led DB2, providing full referential integrity, additional security and a host of features that extend the functionality of DB2.

NOMAD's integrated procedural and non-procedural language and interactive windowing environment boost application development productivity while simplifying data access.

Unlimited outer-join support, application generation tools, an integrated DSS, and a report writer that handles virtually any requirement let you tackle critical applications with ease.

Add NOMAD's cooperative processing options and support for static SQL for DB2 and you have a performance powerhouse under your control.

NOMAD power. Maximize your DB2 investment TODAY. Call 1-800-441-MUST

MUST SOFTWARE

NOMAD is a registered trademark of U3S International Ltd Other product names are trademarks of their respective compa

### D&B installs instant-analysis service

**ON SITE** 

BY AMY CORTESE

MURRAY HILL, N.J. — Dun & Bradstreet Corp.'s Credit Clearing House (CCH) has provided credit information to the apparel industry for more than a century — testimony that timely information is never out of style. Now, D&B has fashioned an expert system to analyze credit.

Part of D&B's Business Credit Services, CCH serves some 60,000 manufacturers, wholesalers and distributors by tracking information on roughly 200,000 retailers, from large chains to small momand-pop shops. By phone or by dialing directly from their personal computers, D&B clients have access to information that can help them determine a retailer's overall business condition.

Like other D&B Credit Services, the apparel industry service has evolved over the years from simply supplying credit information to providing more analysis, even determining a dollar-specific credit recommendation. "We are providing a decision, not a report," said Joseph Pilla, director of product marketing for Credit Services. However, maintaining and analyzing data has proved labor-intensive and time-consuming.

D&B has turned to expert system technology to deliver more up-to-date information. The system, based on Inference Corp.'s ART-IM expert system

shell, accesses information contained in a CCH database to produce a credit recommendation within seconds. In production since last July, the CCH system marks D&B's first expert system application.

The system has been rated a success, according to Pilla. The number of credit analysts has dropped from 12 to eight, while the number of companies the CCH is able to cover has increased by 60,000. A request for information used to take up to three days to fulfill. Now the expert system can come up with a recommendation in a matter of seconds. More importantly, Pilla said, the system "gives customers the benefit of the most experienced analyst and a uniform level of consistency.'

Comprehensive database

The CCH recommendation database is a subset of D&B's corporate reports database, a comprehensive database containing more than 10 million files. In the past, a staff of credit analysts using this information determined dollar-specific credit limits and overall credit ratings for the retailers tracked. When new information became available on an apparel-related company, the analysts would review the information, update the report if necessary and send the updates to a data-entry department for input. Consequently, reports might not reflect the new information for a few days.

Because of production constraints, not all businesses that were of interest to customers could be tracked. While a business report might have been available on a retailer, in many cases a credit recommendation had not been fabricated. That could lead to lost business revenue, according

to a D&B study that found that 30% of customers would abandon the service if a recommendation were not immediately available.

Staffing also posed a problem. It took up to nine months for an analyst to be trained, but the repetitive tasks required of the entry-level analyst resulted in high turnover rates. Then, in addition to training and hiring costs, valuable expertise was lost.

D&B began looking

into expert systems in 1987 and engaged the consulting services of Coopers & Lybrand to help build a prototype knowledge model. A video camera recorded the decision-making process of a senior credit analyst working with a novice analyst with documentation.

The model was shown to roughly 40 customers as a "reality check." "You have to have a grounding," explained Roger Jambor, director of applied research for D&B's Information Systems Management group. "You cannot become enamored with the technology."

D&B then began to look for an expert system shell to implement the model. Since the production platform had not been determined, D&B wanted a transportable shell. "We wanted something we could develop on a PC and deliver on a [Digital Equipment Corp. minicomputer] or a mainframe," Jambor said.

After the CCH application was developed, on a PC, it was moved onto two DEC Microvaxes. DEC equipment was new to D&B, primarily an IBM shop, but the Microvax was selected because it could provide a smooth growth path if the system resource requirements increased.

CCH is linked to an IBM 3090 mainframe containing a Computer Associates International, Inc. IDMS database of CCH records. The

system extracts and reviews financial, historical and background information on a company and uses any number of the 800 rules in the expert system knowledgebase to come to a decision. Customers may rely on this decision or simply use it as a guide in reaching their own conclusions.

Currently, the expert system handles from 80% to 85% of CCH recommendations, the remainder being flagged for analysts to review. That amount is expected to be reduced to 6% to 7%.



D&B's Jambor emphasized system transportability

### Systems tools dominate Dexpo

BY MAURA J. HARRINGTON CW STAFF

NEW ORLEANS — Systems management products were among the key offerings at the Dexpo South show last week, which coincided here with the Digital Equipment Corp. Decus User Group Conference, a few blocks down the road.

Raxco Software, located in Rockville, Md., unveiled Raxmanager Version 3.0, a system software product designed for VAX/VMS products, said Robert Nolan, vice-president of products development.

'Raxmanager Release 3.0 will embed graphics capabilities into the product for the first time," Nolan said, adding that the new version features a smoother interface and performance analysis, disk management and capacity planning features.

The product will be available in July at prices ranging from \$3,000 to \$16,000. depending on configuration, Nolan said.

Raxco also displayed three existing software products it recently acquired from Edison Software, Inc. The tape man-

agement products, which have been renamed, include Tapecontrol, Tapeconvert and Tapeimage, though pricing for the new line has not yet been determined, Nolan said.

Irv Shapiro & Associates, a consulting and training firm focused on products for DEC VAX users, announced its new software division, IRA Solutions, which will include software products and automated systems hardware/software packages, President Irv Shapiro said.

The products, designed for "lights-out operations" of DEC's VAX systems, were on display featuring minor upgrades, the company said. The products include: ISA/ Taskmaster, ISA/Sysmaster, ISA/ Responsemaster and ISA/Netmaster.

On the applications side, Lubbock, Texas-based Compu-Share has incorporated scanned imaging and graphics capabilities into its Human Resources Management package, according to Neil Baldridge, vice-president of engineering for Compu-Share.

The Human Resources Management & Imaging System allows the user to scan photographs, documents and signatures, for example, into the computer along with other text information, Baldridge said.

The advantage of having original information integrated into the on-line human resources package, Baldridge said, is that it can be either transferred via electronic mail or printed on paper.

"It will allow access to original documents where the look and feel of the document is important," Baldridge said.

Compu-Share's Human Resources & Imaging System is priced from \$7,500 to \$50,000 and is designed to be used with Decwindows. The product is slated to begin shipping this fall.

**CONTINUED FROM PAGE 25** 

The CA '90s announcement reassured Sadin that CA's top management was committed to a unification strategy. "I always knew CA had the money to do whatever they wanted. Now I see they have the vision to define an architecture and the commitment to carry it out," he said. The announcement was "more promise than delivery," he said, but "what I am happy about is the commitment."

"Whenever you have a company as large as CA, anything they do to standardize is good. They have already done a lot of that over the last few years - they just didn't call it an architecture," Sadin said.

Some, however, are awaiting more details from CA. Kinder said he is pleased with the direction CA has set but would like more tactical information, for instance, on their database strategy.

With the CA '90s architecture, CA claims it will bridge its various database management products with standard interfaces and access methods. Similarly, it will provide a common interface across all areas of its product line to present a more uniform face to users. Most observers agree this approach is a smart one for CA, but they say it will not be easy.

"It will be a challenge to implement and carry out everything they said they would," said Dale Kutnick, president of market research firm Meta Group, Inc. The sales force "will have to go from being bag-carrying catalog salespeople to architecture salespeople," he said. Ultimately, he said, the architecture "will make customers' lives simpler and enable them to do more with their CA products."

### A DEC challenger with drive

has introduced an 8-in. disk drive that provides 1.7G bytes of formatted storage for DEC VAX machines.

Claiming its new storage subsystem is a better and cheaper alternative to DEC's recently announced 1.5G-byte RA92 drive, System Industries said its drive has a 13-msec average seek time and a data transfer rate of 2.75M byte/ sec. DEC's RA90 and RA92 drives have average seek times of 18.5 and 16 msec, respectively, while their data transfer rate is also 2.75M byte/sec.

The SI817 C-Series drive is the firm's first 8-in. subsystem to incorporate embedded drive interface circuitry, which allows more drives to be

ystem Industries, once again placed in a cabinet. "This is a relatively playing David to Digital new, evolutionary extension of exist-Equipment Corp.'s Goliath, ing drives," said James Porter, president of Disk/Trend in Mountain View, Calif. "SI has normally made use of the newest drives once they're in production on a stable basis."

System Industries uses drives manufactured by Seagate Technology in Scotts Valley, Calif. The drives can connect directly to the hierarchical storage controllers used on DEC Vaxclusters, as well as to DEC KDB50, QDA50 and UDA50 controllers.

The System Industries drives can be mixed with drives of smaller capacities and solid-state disks in tiered storage configurations. Available now for evaluation, the drives are slated to ship in volume by next month, starting at \$25,875 for an entry-level system.

### Will IBM sites find RS/6000 compelling enough to switch?

TEMPE, Ariz. — Some of the largest IBM sites in the country are showing significant interest in IBM's Unix-based RISC System/6000 workstations, and several would consider a switch from other workstation vendors such as Sun Microsystems, Inc., Hewlett-Packard Co.'s Apollo Division and Digital Equipment Corp.

That was the finding of a survey recently released by The Sierra Group and First Boston MIS Executive Council, which polls 50 of its 150 council members each month on computer industry topics.

In a telephone survey conducted in March, 50 information systems directors and corporate vice-presidents were asked their impression of the strengths and weaknesses of the reduced instruction set computing (RISC) workstations. "On a scale of 1 to 10, they gave it an 8 on average," said Merrily Shinyeda, president of The Sierra Group, Inc.

Among the sites surveyed, 29 use workstations as part of their hardware platforms and 11 of those firms said they would consider switching vendors. "That may not sound like a lot," Shinyeda conceded, "but the volume these companies represent could be sizable. These are all highly visible industries, and that makes the numbers more significant."

While IBM may be targeting the RS/6000 at scientific and technical markets. Shinveda said the survey showed a burgeoning interest in commercial accounts at insurance companies, financial and securities institutions and banks. "That says to us that the broader issue of workstations in the commercial marketplace is really picking up." she added.

The Sierra Group and First Boston did not identify the companies responding to the monthly survey, but Shinyeda said most were Fortune 500 firms.

The executives surveyed found the power and price/performance of the RS/6000 compelling enough to outweigh their concerns about a lack of commercial software, Shinyeda noted.

Some of the respondents questioned IBM's experience in the workstation market and worried about the missing support for the RISC workstations under IBM's Systems Application Architecture. "Some of them also cited problems they had with AIX Version 3," Shinyeda said, referring to IBM's version of AT&T's Unix System V operating system.

The Sierra Group researchers found that about one-third of the survey respondents were increasing their company spending on workstations, and about half were spending more on file servers.

HARD BITS

### Unisys extends Surety program

Unisys Corp. has extended its Surety NCR 7766 Clustered Proof machine. Service Program to its A Series, 2200/1100 Series and System 80 mainframe lines, giving users of its large systems new options in maintenance support. The Surety program for the U Series line of Unix-based minicomputers was previously expanded to include Unisys' PC/PW2 line of personal computers.

NCR Corp. and Software Earnings, Inc. in Memphis, Tenn., have joined forces in a marketing agreement to provide check processing systems for the banking industry. NCR officials estimate the worth of the alliance at \$20 million over the next several years. Software Earnings will develop personal computerbased check processing software for the NCR 7770 Multi Pocket Proof machines and productivity tracking software for the

Digital Equipment Corp. has announced two new parts replacement programs to help customers who maintain their own DEC equipment. Decmailer Plus features 24-hour turnaround time for purchase orders, 90-day warranties and return freight paid by DEC. Factory Express for non-DEC components offers discounts on more than 1,800 parts.

Scientists from Thinking Machines Corp. and the Mobil Research and Development Corp.'s Dallas Research lab recently won the IEEE Gordon Bell Prize for parallel computing performance. The winning application is used by Mobil in advanced seismic processing and runs on the Connection Machine supercomputer from Thinking Machines.

### DOS, OS, or CICS Frustration?

## BIM gets it

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-VIO - DOS/VSE Virtual Disk Drive. Moves the Standard Label Area directly into memory and allows for other heavily used non-permanent files to be moved into memory as well.

BIM-PACK — Automatically compresses selected VSAM files transparent to applications and end users under DOS.

**BIMWNDOW** — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM

BIM-EDIT/DOS — The most powerful, flexible full screen editor available for

BIM-EDIT/MVS — All of the features of our popular DOS editor and does not require the overhead of TSO. Can be accessed directly from VTAM or from CICS or other terminal subsystems.

BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982). BIMSPLSR — Optional laser printer support for BIMSPOOL.

BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CIOS application programs into the POWER spooling queue.

BIMSPLIT — May be used separately or with BIMSPOOL to

print parts of an existing job to terminal printers at separate sites.

BIM-PDQ — POWER Dynamic Queuing performance enhancement.

Eliminates 85% of the I/O to heavily used POWER queue.

BIM-PADS — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.

BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. ODISTRAK is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. DOS and OS.

BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.

BIMTEXT — Word processing, document composition system

Create formatted documents from free-form input. DOS and OS.

BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS

partitions without special hardware or additional ports. BIMCMPRS — CICS 3270 data compression system. Reduces response time

for remote terminals significantly. DOS and OS. CICS BM and maintenance. DOS and OS.

BIMECHO - Copies one CRT's output to another or

printer for problem determination and demonstration. DOS and OS.

BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.

BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.

BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.

BIMMONTR — DOS/VSE System Status, Performance Measurement, and

POWER Queue display BIMSUBMT - On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than \$800, average \$2500. You can save

even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request. BIM also performs systems programming consulting, with consultants based in

Minneapolis and Washington, D.C. Computer time services are also available on our 4361-5 system, on-site or remote.



**B** B I MOYLE ASSOCIATES, INC. 5788 Lincoln Drive

Minneapolis, MN 55436

612-933-2885

31

Fax (612) 933-7764 Member Independent Computer Consultants Assn

PROGRAMMERS, ANALYSTS, CONSULTANTS

**EDUCATION/REFERENCE PRODUCTS** YOUR CHOICE: 5 BOOK SET ONLY \$59.95 COMPLETE PC SOFTWARE ONLY \$89.95 SPECIAL: PC SOFTWARE + 5 BOOK SET \$119.95

LIMITED OFFER XDB-LEARN: A COMPLETE PC DBMS/SQL ENGINE W/30 RECS/TABLE LIMIT. PRACTICE DB2/SQL. ONLY \$150 W/ORDER THOUSANDS OF SATISFIED USERS WORLDWIDE

CENTAUR TUTORIAL/REFERENCE PC SOFTWARE

INSTALLS ON PC/XT/AT/PS2 W/512K & HARD DR.

CONTAINS 3 CBT TUTORIALS PLUS ONLINE REFERENCE SYSTEMS. 1. SQL PROGRAMMING- INTRO., DDL, DML, DCL, SYNTAX, EXAMPLES

2. RELATIONAL DATA BASE DESIGN- MODELING, LOGICAL/PHYSICAL DESIGN, PERFORMANCE, DISTRIBUTED DATA FACILITY...

3. APPLICATION DESIGN AND DEVELOPMENT- SQL CURSORS & EMBEDDED, OMF, OBE, CSP/AD....

4. COMMAND/ERROR MSGS. REFERENCE- ONLINE ACCESS TO COMMAND SYNTAX, EXAMPLES, RULES, GUIDELINES, ERR. MSGS.

SYSTEM UPDATED FOR VER 2.2.

3.5 MEG OF INFO FULLY HYPERTEXT W/CROSS REFERENCE INDEX. USE AFTER YOU COMPLETE THE TUTORIALS AS A REFERENCE FOR DB2/SQL ERROR MSGS, SQL SYNTAX, PROGRAM EXAMPLES, DB DESIGN & DB2 APPL DEVELOPMENT GUIDELINES, AND MUCH MORE. SOFTWARE SUPPORT & SITE LICENSING AVAILABLE.

### DB2 ver 2.2/SQL LIBRARY - 987PGS/162 ILLS.

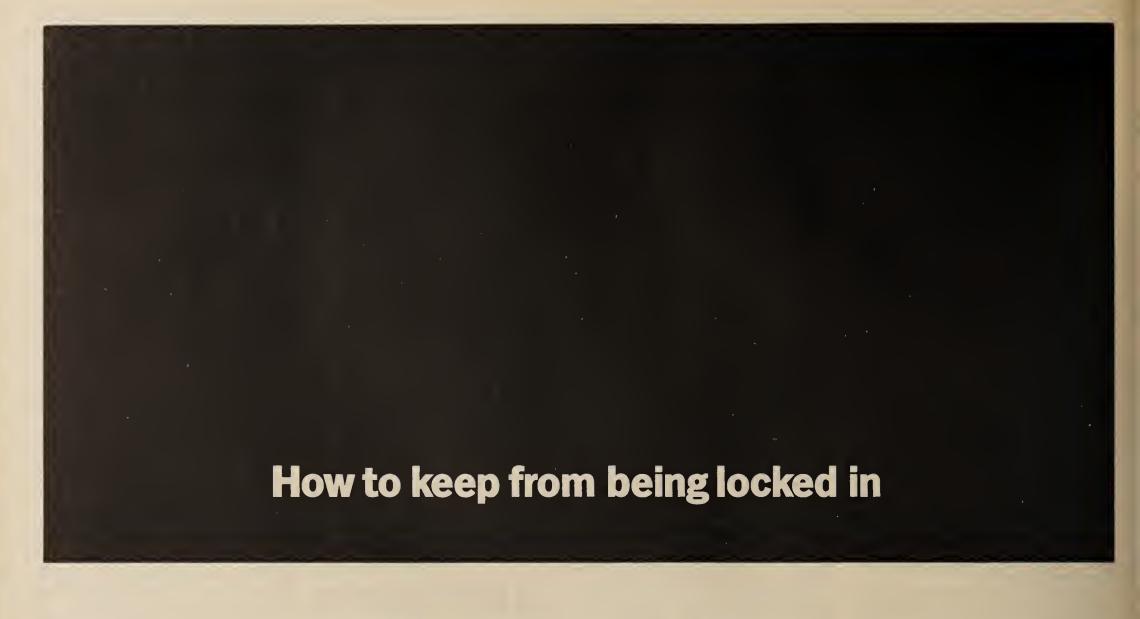
1, DB2 HANDBOOK - INTRODUCTIONS AND COMPLETE OVERVIEW

2. DB2 GUIDE - APPLICATION DESIGN / SQL PROGRAMMING 3. RELATIONAL DATABASE DESIGN - A TO Z APPROACH FOR DBA

4. <u>STANDARD SQL LANGUAGE REFERENCE</u>- USE,SYNTAX,EXAMPLES 5. COMMAND REF. GUIDE-SNYTAX, USAGE, RULES, EXAMPLES

NOW IS THE TIME TO INVEST IN YOUR FUTURE CALL TODAY 1-800-451-1392 OR 914-937-4651 TLM, INC., 420 WESTCHESTER AVE, PORT CHESTER, N.Y. 10573
BO DAY MONEY BACK GUARANTEE VISA/MC/CHECK ADD \$5 POSTAGE/PRODUCT

COMPUTERWORLD MAY 14, 1990



### without being locked out.

Announcing new FOUNDATION® applications development tools that keep your options open.

In the nineties, MIS will have to contend with a bewildering array of multiples. Multiple environments. Multiple platforms. Multiple methodologies. Multiple standards. Multiple vendors.

Multiple headaches.

To ease the way, Andersen
Consulting has just announced
a major expansion of its FOUNDATION suite of full-lifecycle
CASE tools—tools that provide
MIS with unprecedented flexibility to deliver real world solutions across platforms, vendors,
and environments.

FOUNDATION will help you

keep your options open, letting you make the best choices for each environment in the enterprise, free of the constraints of conflicting cultures and proprietary systems.

With FOUNDATION, you won't be locked in to a single vendor, a single standard, or a single methodology, just for the sake of compatibility.

Similarly, you won't be locked out of future advances. If changing business conditions dictate new system solutions, FOUNDATION enables a smooth transition to new platforms and environments.

It all adds up to compatibility without compromise.

So if you're looking at the decade ahead and wondering how you're going to develop the kinds of strategic applications that the times will demand—the ones that are responsive to global conditions, that create real differentiation, that deliver the right information at the right place at the right time—then you owe it to your enterprise to bring FOUNDATION into the picture.

Call us at 1-(800) 458-8851 or 1-(312) 507-5161.



Where we go from here.

we always felt some company

would buy the right to market

# Sharebase buyout appears set for warm user reception

BY JEAN S. BOZMAN CW STAFF

SUNNYVALE, Calif. — Share-base Corp. users who met here recently seemed relieved that their database machine vendor is about to be acquired by \$1.3 billion Teradata Corp. in Los Angeles.

The two firms are in allied businesses, building dedicated processors to run relational database software. The merger, which is scheduled to be finalized in June, follows several years of poor financial results for \$29 million Sharebase (formerly Britton-Lee, Inc.).

"I don't think many users dropped by the wayside over the last few years," said Bob Thompson, president of the Sharebase user group and information systems manager at Reynolds Electrical and Engineering Co. in Las Vegas. "The

#### Revco

**FROM PAGE 25** 

actions and complications, "not just at the item level but at the ingredient level," Adamson said. He said that when there are 612 varieties of a drug such as Darvon, the flags generated by the database are critical. "If an ATM transaction goes wrong, you might have lost \$50. If this is wrong, we may have just killed our customer."

F THIS IS wrong, we may have just killed our customer."

MIKE ADAMSON REVCO

Keeping the rules for insurance billing is almost as critical to Revco's financial health. "There are over 500 carriers, each with different rules [for payment]," Adamson said.

When the stand-alone minicomputers are removed from the pharmacists' offices, they are replaced by "generic brand" personal computers based on Intel Corp.'s 80286 processor. These are attached to the Cyclone via a private wide-area network.

More than 300 stores are online, and new ones are being added at a rate of 30 per week, according to Adamson. The network allows for "thousands of I/Os" for every transaction, and the user gets the screen back in under five seconds, he said. general feeling was that if they didn't get the money they needed to promote their products,

they were going to go out of busi-

ness. The products, though,

were so technically unique that

Users pleased

them," Thompson said.

The 100 users who attended the meeting said they were also pleased with a new release of the Sharebase operating system called Sharebase III that runs on the high-end Server 8000 line. Older Sharebase systems, such

as the Server 500 and Server 700 products, cannot run Sharebase III, company spokesman Scott Humphrey said.

"We needed the date-time stamp and the referential integrity features in Sharebase III," said a U.S. Department of Defense user who did not wish to be identified. "Now that they're supporting the ANSI SQL standard, I can assure my management that the Sharebase machine will be compatible with a great number of dissimilar hardware systems."

The new software release supports the ANSI 89 standard for data exchange using SQL.

Just two weeks ago, Share-base III was certified ANSI 89-compliant by the National Institute of Standards and Technology, according to Humphrey.

TRUER BLUE.



Cincom's SUPRA® High Performance SQL

Relational DBMS is now SAA compliant in all VM and MVS environments as well as VSE. It also runs on VAX™ and UNIX®. Better yet, it's the most powerful DBMS around. Because applications built using SUPRA are DB2 compatible, you can implement relational systems today using SUPRA in your existing environment and run with DB2 later without conversion. So now you can go SAA without spending a blue million. Call today for

more information.



The Most Experienced DBMS Company In The World

33

© 1990 Cincom Systems, Inc. VAX is a trademark of Digital Equipment Corporation. UNIX is a registered trademark of AT&T Corporation.

MAY 14, 1990 COMPUTERWORLD

#### Bozman

**CONTINUED FROM PAGE 25** 

The new quality imperative means more on-site support, more highly trained support personnel — and more handholding.

"When you get to be a big company like IBM, you have to start to act like IBM does, and that includes providing better account support," said Tierney, himself a former IBMer. However, he gave no details of how the new quality imperative will be funded or staffed.

The reason for the change in attitude on financial growth is simple: Oracle is lowering its sights and adjusting to the realities of a product-saturated marketplace. Sales of large computer systems have slowed in North America and, with them, the prospect of selling brand-new Oracle systems to brand-new customers. Recent financial setbacks on Wall Street — Oracle stock lost one-third of its value after a bad earnings report in March — have been like a splash of cold water on the face, jolting Oracle into damage-control action.

Sales orders had been flying so fast at Oracle in recent years that routine maintenance and hand-holding were sometimes overlooked, according to users. They complained that junior support personnel answer the phones and are often unable to resolve difficult problems. Even Tierney conceded, "We recognize that we've got to be more reponsive

when there are problems with our products."

An Oracle database manager at one large Fortune 500 firm underscored the need for greater attention to detail at Oracle. The industrial firm, which has spent hundreds of thousands of dollars at Oracle over the years, was among those that set an ultimatum for better support: Provide it or the Oracle bill will go unpaid. Industry analysts said the user backlash has been intense enough to push Oracle's receivables to 140 days or more — significantly above the industry-standard 90 days.

Strong user resistance prompted meetings with senior Oracle executives in recent months — and angry exchanges of letters between Oracle's California

headquarters and regional user groups. Next month, in an attempt to smooth things over with regional user groups, Ellison, Tierney and other Oracle executives will host the presidents of 10 key user groups at the firm's new headquarters.

"We see this meeting as a kind of open forum on how Oracle conducts business with its existing users," said David Kreines, president of the International Oracle Users' Group, which organizes the annual Oracle user meetings. "Just the fact that they're finally admitting there are problems is encouraging," he

Bozman is *Computerworld's* senior West Coast editor.

# PSDI unveils graphics pack

BY MAURA J. HARRINGTON CW STAFF

CAMBRIDGE, Mass. — Project Software & Development, Inc. recently added graphical user interface capabilities to its Qwiknet Professional project management software when it unveiled Version 2.0 of the package.

Scheduled to ship June 1, Version 2.0 has incorporated interface capabilities that allow the user to draw a project management structure on-screen to get a picture of the project as well as having the facts input under tables that pop up in different windows, said Chip Drapeau, PSDI's director of product marketing. The announcement of the host-based system came at about the same time that Microsoft Corp. introduced a Windowsbased project management package for personal computers (see story page 39).

PSDI sought to make it easier to manipulate screens by redesigning the windowing structure in its product so that a user can access a given chart or feature from more than one location.

Other features include the following: "next step" sign posts to help novice users get around in the product; Planning Dates, which is designed to accommodate activities that must occur regardless of other events; analyses of "what-if" scenarios that are designed to assess how certain factors will affect a project; Resource Management, which automatically calculates activity durations based on the allocated resources and allows for flexible scheduling of activities when user-specified minimum requirements are met; and more, the company said.

Qwiknet Professional Version 2.0 is designed for novices, said Dean Goodermote, vice-president of sales and marketing, because the job of project management is shifting toward the less technical, more business-oriented managers. "This version is a major enhancement of our product, designed to meet the needs of the managers who do not consider themselves project managers per se," he said.

Release 2.0 runs on IBM and compatible PC-based local-area networks, IBM mainframes and Digital Equipment Corp. VAXs and Vaxstations, with an interface option to Oracle Systems Corp. databases, the firm said. Prices range from \$2,500 for a stand-alone copy to \$18,900 per four concurrent users on a VAX.



Yes, I'd like more information about:  RC/QUERYTM RC/UPDATETM RC/MIGRATORTM RC/SECURETM PLATINUM Database AnalyzerTM PLATINUM Plan AnalyzerTM PLATINUM Report FacilityTM The PLATINUM DB2 UtilitiesTM The PLATINUM DB2 GuideTM The PLATINUM ReferenceTM for DB2 PLATINUM Education Series  I'm interested in hearing more about your free 30-day trials.  I'd like to schedule an in-house presentation.	PLATINUM technology The DB2 Company™  (708) 620-5000 (800) 442-6861(toll-free) (800) 848-0140 (Canada)
ne	
npany	
lress	
, State, Zip	TP MonitorCW590
Comment of the Commen	011330



**BUSINESS REPLY MAIL** 

FIRST CLASS PERMIT NO. 137 LOMBARD, IL

POSTAGE WILL BE PAID BY ADDRESSEE

PLATINUM technology, inc. 555 WatersEdge Drive Lombard, IL 60148-9930

httottoodhiladahlahlahladhladhol

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

#### NEW PRODUCTS — HARDWARE

#### Data storage

Symmetrical Technologies, Inc. has announced DDS-1300, a digital audio tape subsystem that offers 1.3G bytes of tape storage.

The system provides transparent access with interfaces to Digital Equipment Corp. VAX systems, Sun Microsystems, Inc. computers and Apple Computer, Inc. Macintoshes. It is also plug-compatible with small computer systems interface hardware and operating system software for Wang Laboratories, Inc., NCR Tower Corp., Altos Computer Systems and Hew-

lett-Packard Co. Apollo computers.

The product's price ranges from \$2,500 and \$4,100, depending on the hardware platform used.

Symmetrical Technologies Suite 231 301 Gallaher View Road Knoxville, Tenn. 37919 615-690-3838

Hitachi America Ltd. has introduced two 51/4-in. Winchester hard disk drives.

The 1.23G-byte DK516-12 has a 14-msec. average seek time and a 2.75M bit/sec. data transfer rate. It is equipped with an enhanced small device interface.

The 1.65G-byte DK516C-16 offers a 13.5-msec average seek time and a 3M-bit/sec. data transfer rate. Its small computer systems interface (SCSI) supports enhanced SCSI-2 commands.

Pricing is \$3,200 for the DK516-12 and \$4,300 for the DK516C-16 in OEM quantities.

Hitachi Hitachi Plaza 2000 Sierra Point Pkwy. Brisbane, Calif. 94005 415-589-8300

Gigatape, GmbH, the parent company of Gigatrend, Inc., has co-developed a plugand-play 4mm digital audio tape backup product with Bull H. N. Information Systems, Inc. in West Germany.

The Giga-Dat 5¼-in. form-factor drive provides users with 1,000 passes on tape and features first backup speeds of 4M byte/min., according to the vendor. Advanced error correction coding and a read-after-write feature reportedly enable the drive to yield error rates of less than 1 in 10<sup>15</sup>.

The media cost to back up 1G byte using Giga-Dat is \$36. Internal versions of the product sell for \$7,450.

Gigatrend P.O. Box 4298 2234 Rutherford Road Carlsbad, Calif. 92008 619-931-9122

#### I/O devices

Digital Equipment Corp. has announced the VRE01, a 19-in. flat-panel monitor for use with its workstations and windowing terminals.

The product is based on electroluminescent technology and offers 1,024- by 864-pixel screen resolution with a 60-Hz vertical refresh. The monitor weighs 18 pounds and needs only 51 sq. in. of desk space.

The VRE01 is currently priced at \$11,995 and is available now, according to the vendor.

DEC 146 Main St. Maynard, Mass. 01754 508-493-3690

A color computer monitor that provides 2,048- by 2,048-pixel resolution on a 20-by 20-in. screen has been announced by the Precision Graphics Systems Division of Sony Corp.

The Sony 20/20 was designed for imaging applications in areas such as air traffic control, medicine and science. The monitor incorporates features of Sony's Trinitron aperture grille technology, including a 0.31mm phosphor pitch and a flat-screen display that minimizes distortion and light reflection, according to the vendor.

The monitor is available in two models: the DDM-2801C, with a price of \$40,000, and the DDM-2802C, for a price of \$47,300. Pricing includes both a cabinet and a bezel.

Sony 9 W. 57th St. New York, N.Y. 10019 212-418-9427

#### **Processors**

Sky Computers, Inc. has introduced a multiprocessor digital signal processor board based on the Texas Instruments, Inc. TMS320C30 microprocessor.

The Sky Challenger-C30 combines two C30 chips that can perform 32 bit/sec. data transfers. The product includes 576K bytes of random-access memory and up to 8M bytes of dynamic RAM, according to the vendor.

It offers performance of up to 66 million floating-point operations per second or 32 million instructions per second and features applications such as radar, sonar, seismic processing, speech recognition, acoustics, imaging and three-dimensional graphics

The list price for Sky Challenger is \$11,750.

35

Sky 27 Industrial Ave. Chelmsford, Mass. 01824 508-250-1920

# DB2 JUNGLE with

PLATINUM technology, inc.

uccessful explorers seek the guidance of the best professional outfitters and trackers before leading an expedition into dangerous, unknown territory. They understand that the right equipment and expert knowledge of the terrain are critical to the success of their mission.

PLATINUM *technology, inc.*, was one of the first companies to delve into the uncharted DB2 jungle.

Today, we are recognized internationally by our trailblazing clients as the world's foremost professional outfitters for DB2.

With our complete kit of DB2 software tools, published products, and education and our worldwide network of affiliated companies, PLATINUM has set the standards for quality and service in the DB2 market.

#### Software Products

- RC/QUERY™
- RC/UPDATE™
- RC/MIGRATOR™
- RC/SECURE™
- PLATINUM Database Analyzer<sup>™</sup>
- PLATINUM Report Facility<sup>™</sup>
- PLATINUM Plan Analyzer<sup>™</sup>
- PLATINUM Utilities for DB2<sup>™</sup>

#### DB2 Education

- Introduction to DB2
- DB2 Database Design and Application Planning
- DB2 Database and System Administration
- DB2/SQL Application Programming
- CSP Application Programming
- Using DB2 and QMF

#### **Published Products**

- The PLATINUM DB2 Guide/Online
- The PLATINUM Reference<sup>™</sup> for DB2
- The PLATINUM DB2 Catalog Poster

As you begin your trek into unfamiliar, little explored regions of relational technology, PLATINUM can outfit you with everything you need to make your DB2 adventure a success. We've been there, so we know what it takes.

Let PLATINUM be your expert guide through the wilds of the DB2 jungle.

Call **1-800-442-6861** today for more information or a free on-site trial evaluation of any PLATINUM product.

IBM is a registered trademark and DB2 and QMF are trademarks of International Business Machines Corporation.



PLATINUM technology, inc. 555 WatersEdge Drive, Lombard, IL 60148 (708) 620-5000 FAX (708) 953-1923 1-800-442-6861 (US) 1-800-848-0140 (Canada)



COMPUTERWORLD

# The Open RDBMS

#### The Sybase View

Today's changing business environment demands full exploitation of multivendor network computing. The challenge is to integrate existing applications with new on-line systems, preserve past investments and create an open, flexible architecture for the future.

The allure of standardizing on a single RDBMS and migrating existing applications is tempting, but utopian. This "one size fits all" strategy will not preserve existing investments. And it raises the spectre of being locked into a single software vendor.

The solution: an Open RDBMS. One that provides hardware and software interoperability. One that offers a *true* open architecture and provides integration of decision support and transaction processing. One with the support of leading hardware and software manufacturers to provide heterogeneous interoperability. And one with a full range of technology integration services that can weave these heterogeneous environments into a unified computing enterprise.

**OPEN ARCHITECTURE.** Open architecture gives hardware and software companies — customers and competitors — access to comprehensive open interfaces. These open interfaces must be based on standards and available for extension and industry adoption. Only a network based client/server architecture, with such open interfaces, can meld an array of operating systems, networking protocols, and applications into a seamless computing enterprise.

**DECISION SUPPORT.** To handle real-time decision support across multiple systems, an Open RDBMS must provide interfaces that can:

- read data from any RDBMS, non-relational DBMS, or file system
- communicate with all dialects of SQL and with non-relational data manipulation languages.

**TRANSACTION PROCESSING.** To integrate production transaction processing applications, an Open RDBMS must provide interfaces that can:

- control inter-system transactions for concurrency, consistency and recovery
- provide access to application programs, as well as databases, to assure complete data consistency for updates
- integrate application-specific logic for custom functionality and performance
- transparently access such external data sources as real-time feeds, process control data, electronic document exchange, and mail services

**MULTI-VENDOR INTEGRATION.** An open system requires the full backing and support of industry leaders to ensure customers the benefits of direct interoperability. It creates a vendor-independent, open architecture that is more flexible than a single, vendor-centric approach.

**TECHNOLOGY INTEGRATION.** Making the open system work requires the assistance of a professional support organization with multi-vendor experience in DBMSs, operating systems, networks, and hardware.

Only SYBASE delivers on all of these requirements.

The SYBASE open client/server architecture is based on a commitment to standards. It provides enterprise-wide integration of decision support and transaction processing that marries SYBASE and non-SYBASE data, applications and services. Alliances with industry leaders like Apple, AT&T, DEC, DG, IBM, HP, Lotus, Microsoft, NeXT, Pyramid, Sequent, Stratus, Sun and over 100 independent software vendors ensure interoperability—not just portability. And Sybase's professional services division, SQL Solutions, Inc., now provides complete integration services and customer support for single or multi-vendor environments.

SYBASE. The Open RDBMS to make the open computing enterprise a reality.

#### THE SYBASE FORUM

This view of The Open RDBMS first appeared in The Sybase Forum (Computerworld, March 12, 1990).

# Look W You C

SYBASE Open Client/Server Interfaces allow data and application integration and interoperability in a multi-vendor environment.

SYBASE Open Client provides an application programming interface (API) for accessing and updating data using a variety of front end tools or applications—including SYBASE applications, independent software vendor's tools, or user-written applications. SYBASE Open Server provides an API for accessing and updating a variety of foreign data sources and application services. Open Server can seamlessly integrate hierarchical and relational DBMSs, third party applications and real-time data feeds into SYBASE applications.

Together, Open Client and Open Server interfaces and getaways make real-time access to various data sources and application services across networks completely transparent regardless of protocol—the essence of the on-line enterprise.



"An impressive piece of work, SQL Server delivers on its claims for high-performance transaction processing. Fast, powerful, with many innovative features that are useful yet surprisingly easy to learn and use, this multiuser database server has a promising future."

SQL Server was designed to help give continuous OLTP application availability 24 hours a day, 7 days a week.

It handles maintenance operations (backups, diagnostics, design and integrity changes) while all other applications continue to run

It protects against loss of integrity during a system failure so that all changes to the database can be rerun quickly and accurately.

It also supports fault tolerance in media failures even when the hardware doesn't.

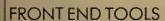
Sybase's professional services division, SQL Solutions, focuses exclusively on providing relational database services and tools

SQL Solutions provides customized solutions with a complete line of SQL productivity tools that ease every step of

the application development life cycle.

SQL Solutions' products support all major DBMSs across all major hardware platforms. The firm has designed, developed and integrated more relational systems in the on-line enterprise-wide network computing arena than all of the leading RDBMS vendors combined.

# hat Happens When pen An RDBMS.



ACCELL/SQL ACCESS/STAR COSMOS dBASE III **dBASE IV** DataEase SQL **EXCEL FOCUS** JAM JAM/DBi **NEXPERT OBJECT** 1-2-3 **PARADOX** Software through **Pictures** SPSS-X And more.

Today, more than ever, industries such as banking, manufacturing, telecommunications, and government are developing integrated applications for on-line transaction processing and decision support. They are, in short, managing the data needed to make successful business decisions.

For example, a typical on-line application for foreign currency risk managers must track fluctuations in a rapidly changing market, where over 15,000 currency price changes occur daily. Concurrently, decision support applications need to analyze on-line data to reduce potential risks.

What's needed is an on-line database system powerful enough to handle real-time decision support analysis—and that system is SYBASE.

That's why 18 out of the top 22 brokerage houses have chosen SYBASE. One firm uses

SYBASE to track market fluctuations and to analyze appropriate responses.

"With SYBASE, the system can suggest the best combination of corrective trades under current market conditions."

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
March 5, 1990 - Vol. XXIV No. 10 - 120 Pages - \$2/Copy \$48/ Year

18 out of the top 22

brokerage firms use SYBASE.

#### **COMPUTERWORLD**

"In a preference test pitting some of the most advanced SQL-based relational database management systems against one another, SYBASE... came out on top in overall user satisfaction." March 5, 1990.

SYBASE earned top ratings in eight out of 18 categories:

- Performance in processing on-line transactions
- Performance in decision-support applications
- Providing effective user-defined integrity
- DBMS enforced integrity
- Useful SQL extensions
- Distributed updating, recovery and remote administration
- Extensions to the relational database management system such as semantic, object oriented text and image modeling
- Performance and system monitors

Strategic alliances with other industry leaders are critical to successful interoperability. With SYBASE, the results have been impressive.

In commenting on SQL Server, Microsoft stated: "Microsoft surveyed the entire SQL database market and chose SYBASE technology as the most powerful. SYBASE is the perfect partner to help Microsoft apply the power of OS/2 to multi-user database environments."

And Lotus, in announcing its alliance with SYBASE, said: "This partnership with SYBASE demonstrates our belief in the importance of database products as an extension of our core business, and is an important step in our effort to provide our spreadsheet users with access to diverse sources of data."

#### Lotus

Microsoft

In the real world of multi-vendor environments, SYBASE preserves your prior hardware and software investment while keeping your future options open.

SYBASE SQL Server supports portability to a wide range of strategic computing platforms, including VAX/VMS, UNIX, and OS/2, with PC and MAC connectivity, making it a natural for linking applications residing on different types of machines.



Client/Server For The On-Line Enterprise For more information or seminar reservations, call 1-800-8-SYBASE.

#### **SYBASE SEMINAR SCHEDULE/APRIL-JUNE, 1990**

Now that you've gotten this glimpse of what the Open RDBMS can do, we hope you'd like to see more. Please join us for a free seminar. We'll explore a host of RDBMS issues and present a demonstration of many on-line transaction processing and decision support features.

For seminar reservations, or more information about SYBASE use the coupon or call **1-800-8-SYBASE**.

Alabama		District of Colum	nhia	Maryland		Ohlo	
Birmingham	May 22	Washington	May 15	Baltimore	April 24	Cincinnati	May 30
Huntsville	June 6	Florida		Massachusetts		Oregon	
Alaska		Fort Lauderdale	May 2	Boston	May 17	Portland	May 29
Anchorage	May 10	Jacksonville	June 7	Michigan		Pennsylvania	
Arizona		Tampa	May 24	Detroit	May 23	Harrisburg	May 17
Phoenix	May 15	Georgia		Missouri		Tennessee	
California		Atlanta	May 9	St. Louis	April 25	Nashville	May 2
Los Angeles	April 24	Hawali	1400	New Jersey		Texas	
San Diego San Francisco	May 31	Honolulu	May 30	Saddle Brook	May 24	Houston	May 15
Santa Clara	May 9 June 5	Illinois	May 17	New York		Washington	
Westlake Village	May 16	Chicago	May 17	New York City	May 1/	Seattle	June 7
Colorado		Indiana	June 6	Rochester	June 5 April 25	Canada	
Denver	June 5	Indianapolis	June o	Syracuse	June 5	Calgary	May 8
Connecticut		towa Des Moines	May 29	Tarrytown	May 10	Montreal Toronto	April 25 May 24
Hartford	June 5	Des Mollies	Iviay 25	North Carolina	,	10101110	Iviay 24
Stamford	May 22			Charlotte	June 6		
1							

☐ Register me for the Sy (date)	. All seminars run from	d in (city)on 9am to noon.
Name		Title
Company		
Address		Apt
City	State	Zip
Phone ()	Ext	
Mailto, Sybasa Samir	are 6475 Christia Av	enue Emeraville CA 94608

#### NEW PRODUCTS — SOFTWARE

#### **Development tools**

Sunrise Software Systems, Inc. has announced a graphical user interface system that provides users with an interface to the X Window System and the Open Software Foundation's Motif.

The EZX Version 2.0 for Motif interface contains three modules: Ezxdraw, which interactively designs Motif or Sun Microsystems, Inc.'s Open Look user interfaces; Ezxlib, a library that provides an interface to application programs that is independent of a windowing system; and Ezxdemo, which demonstrates a user interface without the need for program-

Pricing for EZX Version 2.0 begins at \$3,500 for a single-user version. Sunrise

1151 Aquidneck Ave. Middletown, R.I. 02840 401-847-7868

Oracle Systems Corp. has added an integrated graphics application product to its generation of application development

Oracle Graphics provides users with graphic analysis of time-varying database information. Its point-and-click interface

enables nonprogrammers to create more than 50 charts and change more than 60 chart parameters, the vendor said.

It can run on X Window System, Digital Equipment Corp.'s Decwindows or the Open Software Foundation's Motif. It will be available for DEC's Vaxstations in the third quarter.

Pricing ranges from \$1,400 for a single-user license for use on Sun Microsystems, Inc. Sun-3 and Sun-4 workstations to \$19,000 for a 64-user license.

Oracle 20 Davis Drive Belmont, Calif. 94002 415-598-8000

Inter-Data Computer Services, Inc. has announced a programming interface for IBM's Restructured Extended Executor (Rexx) language and SQL.

DB2REXX/TSO can embed SQL statements in a Rexx program, and SQL commands can be issued by using a command window, which displays results of single-screen or multiple-screen queries in a scrollable format, according to the vendor. The product requires a hardware configuration that can run on MVS/XA or MVS/ESA, IBM's TSO/E Version 2 or higher and DB2 Version 2 or higher.

A software license for the product costs \$12,500 per mainframe.

Inter-Data **Suite 107** 2500 Maitland Ctr. Pkwy. Maitland, Fla. 32751 407-660-0004

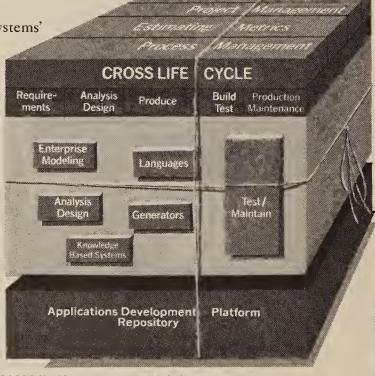
### Introducing



AGS Management Systems' firstCASE is the first step toward fully realizing the potential of CASE. It will help you build systems in an efficient, organized way by tying together every single component of the life cycle - not just parts of it.

Compatible with SAA/ CUA and IBM's AD/Cycle architecture, firstCASE provides you with:

- automated methodologies
- estimating and metrics support
- fully integrated project management
- open architecture CASE tool interface



IBM's AD/Cycle Architecture

And firstCASE's distributed/cooperative architecture supports PCs, LANs, and mainframes.

To find out the many ways that firstCASE, the cross life cycle solution, can help you tie it all together for greater efficiency and productivity, write or call our toll-free number: 1-800-678-8484.



COMPREHENSIVE SOLUTIONS THE MANAGEMENT OF SYSTEMS DEVELOPMENT



A NYNEX Company

880 First Avenue King of Prussia, PA 19406 1-800-678-8484 (215) 265-1550 FAX: (215) 265-1230 IBM, SAA are trademarks of IBM Corp.

#### **Training**

Computer Systems Research, Inc. has announced its MVS Diagnostics Laboratory, a series of video, computer-based course modules and software components designed for use by MVS systems programmers.

The system comprises three segments: an MVS/ESA Problem Determination Environment, an IBM Interactive Problem Control System (IPCS) and a CSR Diagnostic Procedure. The IPCS enables programmers to resolve system outages more effectively, according to the vendor.

MVS Diagnostics Laboratory costs between \$10,500 and \$20,000, depending on the license type and number of users.

**CSR** P.O. Box 45 Avon Park South Avon, Conn. 06001 203-678-1212

#### System software

SDC Software, Inc. has announced Release 3.3 of its Standard Purchasing System for IBM System/36 and Application System/400 computers.

The enhanced software package includes integrated code look-ups and enables users to search for items by description, category or alternate item number. The product also allows users to enter multiple general-ledger numbers per line item, enter nonpart numbered items and assign purchase order numbers, according to the vendor.

The price is \$4,000 for a license and source code.

SDC

P.O. Box 3360 Carson City, Nev. 89702 702-883-9339

BMC Software, Inc. has announced Release 2.2 of Data Packer/DB2.

The product can be installed on an IBM MVS/XA or MVS/ESA system in less than one hour without an initial program load or DB2 outage, the vendor said. Pregenerated Editprocs and a facility to generate customized Editprocs to compress different types of data are provided. A data integrity feature provides a facility for automatic backup and recovery of customer-generated Editprocs.

A perpetual license for Data Packer/DB2 ranges from \$15,000 to \$57,500, depending on the type of CPU.

**BMC** P.O. Box 2002 Sugar Land, Texas 77487 800-841-2031

### PCs & WORKSTATIONS

M I C R O
B I T S

Douglas Barney

## Window pains



It's a strange thing in a technology industry, but nobody in the computer business uses something

when it first comes out. Unix took 20 years to reach its current level of popularity. IBM's Micro Channel Architecture is only now getting respect after three years of availability.

As for Microsoft's Windows, it has taken more than seven years to hit its stride. After years of justified derision, people are starting to say nice things about Windows — particularly Version 3.0, which is reportedly on the verge of shipping.

Calling it 3.0 is appropos because the system has three modes. It retains the old, Intel 8086-oriented real mode, which is the one everyone always complained about and the reason OS/2 was built. Still being 640K-byte bound, real mode is the dumbest, most limited personal computer mode known to mankind. Still, some people use kludgy schemes that fool the computer into thinking it has more than 640K, which allows them to run memory-hogging Windows applications. Real mode has always been Win-

Continued on page 46

#### IBM not singing the OS/2 blues

Soyring downplays problems, says solid sales are grounds for optimism

It's too soon to call OS/2 a disappointment — at least at IBM, according to John Soyring, director of IBM's Austin programming center. Moreover, Soyring, who can be called Mr. Extended Edition, claimed that IBM met all sales expectations for both OS/2 Extended Edition and OS/2 LAN Server in the latter half of 1989 and is exceeding expectations so far for 1990.

In a recent interview with Patricia Keefe, Computerworld's Senior Editor of PCs & Workstations, Soyring talked

about which IBM customers are buying OS/2 and why. He also addressed the backbiting between the Microsoft Corp. Windows and OS/2 camps and offered advice to those wavering between Windows and OS/2's graphical user interface.

Are users waiting for applications or for OS/2 2.0? I think a large number of people are satisfied with the functionality that OS/2 is offering today. Availability of applications is key, but you'd expect tool kits to



Soyring says many users are 'satisfied' with OS/2's offerings

come out first because developers need them.

Is your typical OS/2 customer a corporate developer building a business application or a power user?

I see a mix of both. OS/2 Extended Edition offers a tremendous opportunity to offer applications difficult to introduce into any DOS environment. We work with a large number of corporations that recognize that by automating large business processes, they can get a larger return on investment than before.

But there are still a large number of personal productivity application users who find large Continued on page 50

# Microsoft revitalizes project management

BY CHARLES VON SIMSON CW STAFF

REDMOND, Wash. — Microsoft Corp. announced a graphical entry last week into the sleepy market for personal computer management software. Microsoft Project for Windows was seen by both analysts and early users as good enough to give the application category a new lease on life.

"We have had a number of bad experiences with computerized project management. Our users used to see it, scream and run away," said Mark Dulle, manager of decision support systems at Mervyn's, the Hayward, Calif.-based retail chain. Mervyn's was a beta-test site for the product.

"The graphical strength of Windows, as well as the flexibility Microsoft has built into it, makes it a platform on which we can standardize," he added.

Analysts saw the product's ease of use as a significant advantage over competitive offerings, but they cautioned that project management is by nature a complex process.

"The product is easier to use than any spreadsheet," said Daniel Yahdav, president of 1 Soft Decision, Inc., a San Rafael, Calif., project management consulting company, "but users should still expect a substantial learning curve. Even with a PC, managing a project is more an art than a science."

Yahdav said that many of the barriers to implementing project management systems had nothing to do with the technology. "As long as specific plans and schedules are fuzzy, they can be changed without anyone knowing," he said, "but if you add a computerized plan that anyone can read off the network, you are accountable. There can be a lot of resistance from managers."

#### **Helpful Windows**

The Windows version of Project adds substantial functionality to many of the program's capabilities. The ability to add fields, support numerous charts and output modes and exchange data with other Windows applications has been improved.

Two areas, however, disappointed users and analysts. The first is that the initial version of the product, available from re-

sellers later this month, will not include support for Microsoft's SQL Server database server. While the system will allow multiple users to access a file, it will not allow full file sharing or cooperative processing.

"That is somewhat frustrating," Dulle said, "There is really no such thing as a stand-alone PC anymore, and we are looking forward to support for SQL environments."

In addition, the system will not support Windows' Dynamic Data Exchange capability. While the system will allow for data to be transferred between applications via the clipboard function, Dynamic Data Exchange support will wait for a later edition. "That was simply one of the trade-offs we had to make to get the product out," a Microsoft spokesman said, "but [Dynamic Data Exchange] is extremely important, and we will get it in a later release."

# Some folks think that COBOL, the language of the past, may also be the language of the future!

Micro Focus COBOL/2 Workbench Awarded 1989 Professional Solutions Award......PC Tech Journal, 2/89

 Micro Focus "ANIMATOR is a sparkling example of the reason why the PC-based COBOL workstation represents a quantum leap in programmer productivity." . . . . . . . . . . . . . . . . Database Programming & Design, 10/88

"Could COBOL be the key to the success of OS/2?" . . BYTEweek , 6/19/89

Micro Focus Awarded Four Out of Four Ribbons for "Overall Value" in Readers' Choice Awards . . . . . . . . . . Information WEEK, 4/24/89

#### MICRO FOCUS®

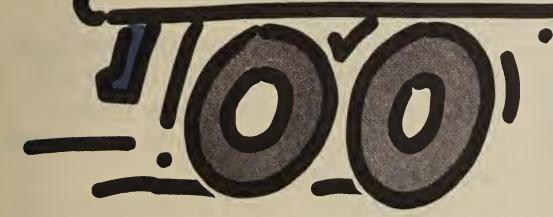
A Better Way of Programming™

Call us at 1-800-872-6265 or 415-856-4161.



Before Roadway's trucks make deliveries across the country, their computers do. With a Networke deliver loads of information to customers in seconds. And stay on top of the trucking business. Ca

SSOCIATES, CHICAGO, IL, 5/15, 7 DRUMS, FREIGHT CLASS 85, 578 LBS.; NELSON SUPPLIES, FRESNO, CA, 7/23, 16 BOXES, FREIGHT CLASS 77.5, 80 (19, 55 CRATES, FREIGHT CLASS 440, 1700 LBS.; FULLER & SEILER MARKETING CO., NY, NY, 6/19, 300 BOXES, FREIGHT CLASS 21, 700 LBS.; THIR A, 4/29, 800 DRUMS, FREIGHT CLASS 88, 900 LBS.; KLEIN AND SONS SUPPLIES, BOSTON, MASS, 3/20, 800 BOXES, FREIGHT CLASS 200, 450 LBS. ONN, 5/24, 75 CARTONS-PERISHABLE, FREIGHT CLASS 85, 1300 LBS.; WITT BROTHERS PUBLISHING, SAN FRANCISCO, CA, 3/22, FREIGHT CLA ADVERTISING INC., BRENHAM, TX, 250 CARTONS, FREIGHT CLASS 75, 400 LBS.; KELLEY MANUFACTURING COMPANY, LANCASTER, PA. 6/04, 300 I 1500 LBS.; SUPERSTORES NORTH AMERICA, CHICAGO, IL, 4/02, 1200 CARTONS, FREIGHT CLASS 235, 300 LBS.; LIGHTS INC., TOPEKA, KA. 450 CARTO COHEN & PARTNERS, SYRACUSE, NY, 5/25, 680 DRUMS, FREIGHT CLASS 120, 200 LBS.; TGIF PRODUCE CORPORATION, DENVER, CO, 4/18, FREIGHT CLASS 120, 200 LBS.; TGIF PRODUCE CORPORATION, DENVER, CO, 4/18, FREIGHT CLASS 120, 200 LBS. NSTITUTE, BOISE, IDAHO, 6/10, FREIGHT CLASS 21, 500 LBS.; ACME MANUFACTURING, NEW ORLEANS, LA, 5/21, 100 CARTONS, FREIGHT CLASS 250 3/18, 10 BOXES, FREIGHT CLASS 75, 900 LBS.; SMITH ASSOCIATES, CHICAGO, IL, 5/15, 7 DRUMS, FREIGHT CLASS 85, 578 LES.; NELSON SUPPLIES, FREIGHT CLASS 85, 578 LES.; NELSON SUPPLIES, FREIGHT CLASS 440, 1700 LBS.; FULLER & SEILER MARKETING CO., NY, NY, 6/19, 3 THIRD AVENUE BOTTLING, PHILADELPHIA, PA., 4/29, 800 DRUMS, FREIGHT CLASS 88, 900 LBS.; KLEIN AND SONS SUPPLIES, BOSTON, MASS, 3/20, 800 MCKELDEN'S NURSERIES, HARTFORD, CONN, 5/24, 75 CARTONS-PERISHABLE, FREIGHT CLASS 85, 1300 LBS.; WITT BROTHERS PUBLISHING, SAN FRAN BS.; HAMILTON & MATHER ADVERTISING INC., BRENHAM, TX, 250 CARTONS, FREIGHT CLASS 75, 400 LBS.; KELLEY MANUFACTURING COMPANY RUMS, FREIGHT CLASS 70, 1500 LBS.; SUPERSTORES NORTH AMERICA, CHICAGO, IL, 4/02, 1200 CARTONS, FREIGHT CLASS 235, 300 LBS.; LIGHTS REIGHT CLASS 45, 344 LBS.; COHEN & PARTNERS, SYRACUSE, NY, 5/25, 680 DRUMS, FREIGHT CLASS 120, 200 LBS.; TGIF PRODUCE CORPORATION, DEN BS.; SIMPSON TECHNICAL INSTITUTE, BOISE, IDAHO, 6/10, FREIGHT CLASS 21, 500 LBS.; ACME MANUFACTURING, NEW ORLEANS, LA, 5/21, 100 CARTON LIMBER, SYRACUSE, NY, 6/18, 10 BOXES, FREIGHT CLASS 75, 900 LBS.; SMITH ASSOCIATES, CHICAGO. IL, 5/15, 7 DRUMS, FREIGHT CLASS 85, 578 LBS.; NOXES, FREIGHT CLASS 77.5, 889 LBS.; BOYKO CONSTRUCTION, LA, CA, 8/19, 55 CRATES, FREIGHT CLASS 440, 1700 LES.; FULLER & SEILER MARKETING LASS 21, 700 LBS.; THIRD AVENUE BOTTLING, PHILADELPHIA, PA, 4/29, 800 DRUMS, FREIGHT CLASS 88, 900 LBS.; KLEIN AND SONS SUPPLIES, BOSTON, NO. 00, 450 LBS.; MCKELDEN'S NURSERIES, HARTFORD, CONN, 5/24, 76 CARTONS-PERISHABLE, FREIGHT CLASS 85, 1300 LBS.; WITT BROTHERS PUBLISHIN LASS 23, 500 LBS.; HAMILTON & MATHER ADVERTISING INC., BRENHAM, TX, 250 CARTONS, FREIGHT CLASS 75, 400 LBS.; KELLEY MANUFACTURING COMP 00 drums. Freight class 70, 1500 lbs.: superstores north america, chicago, il, 4/02, 1200 cartons. Freight class 235, 300 lbs., lights reight class 45, 344 lbs.; cohen & partners, syracuse, ny, 5/25, 680 drums, freight class 120, 200 lbs.: tgif produce corporation, denver MPSON TECHNICAL INSTITUTE, BOISE, IDAHO, 6/10, FREIGHT CLASS 21, 500 LBS.: ACME MANUFACTURING, NEW ORLEANS, LA, 5/21, 100 CARTONS, FREIGH RACUSE, NY, 6/18, 10 BOXES, FREIGHT CLASS 76, 900 LBS.: SMITH ASSOCIATES, CHICAGO, IL, 5/15, 7 DRUMS, FREIGHT CLASS 85, 578 LBS.; WITT BROTHERS I EIGHT CLASS 23, 500 LBS.; HAMILTON & MATHER ADVERTISING INC.. BRENHAM, TX, 250 CARTONS, FREIGHT CLASS 75, 400 LBS.; KELLEY MANUFACTURIN DLLS, 200 DRUMS, FREIGHT CLASS 70, 1500 LBS.; SUPERSTORES NORTH AMERICA. CHTCAGO, IL, 4/02, 1200 CARTONS, FREIGHT CLASS 235, 300 LBS.; 1.IC MPSON TECHNICAL INSTITUTE, BOISE, IDAHO, 6/10, FREIGHT CLASS 21, 500 LBS ; ACME MANUFACTURING, NEW ORLEANS, LA, 5/21. 100 CARTONS, FREIGH



omputing Solution from AT&T Computer Systems, they now 800 247-1212, Ext. 545. We'll help you get the wheels turning.



# In the stock market, insider information is a crime. In the OS/2 market, it's a blessing.

Now you can invest in futures and get the edge on your competition, all at the same time.

With the OS/2 version 2.0 Software Development Kit program.

OS/2 v. 2.0

Software Development Kit



It has everything you need to jumpstart your new 32-bit applications. And take full advantage of Intel's 386™ and i 486 $^{\text{m}}$  processors.

Not to mention OS/2's graphical interface, multi-tasking and advanced memory management.

You get successive pre-releases and final versions of 32-bit OS/2, Microsoft C and MacroAssembler.

You also get Microsoft's improved

CodeView debugger.

Access to your OS/2 network while you're developing code.

And of course, expert on-line tech-

nical support.

Call (800) 227-4679, Dept. L79, to find out more. And do it now.

The early bird gets the application.

Microsoft Making it all make sense

#### Building on a Systempro base

Construction firm uses network with Compaq, Microsoft foundation

#### ONSITE

BY RICHARD PASTORE

PARIS — Europe's No. 2 construction company did not put up the Eiffel Tower, which punctuates the skyline two miles from its headquarters here. It missed out on the Arc de Triomphe as well. But the Dumez Group is laboring to erect its own monument to distributed processing using the latest technology tools — Compaq Computer Corp.'s multiprocessor Systempro and Microsoft Corp.'s OS/2 Version 1.2.

Alain Vignon, manager of personal computing at Dumez's Paris headquarters, bought the department's first network server two years ago — a Compaq Deskpro 386. "We chose Compaq because they had a bigger product line," Vignon said.

Today, the building runs 11 networks, and 95% of its 250 personal computers are Compaqs. So it was a natural "evolutionary step" to buy two Intel Corp. 80386-based dual-processor Systempros in December, Vignon said.

"With the speed at which hardware becomes obsolete, I'd rather invest in a Systempro and stay ahead of the curve," Vignon said. "If you compare the Systempro to a regular Compaq file server, the Systempro is less expensive in terms of evolution and path for growth."

#### Careful shopper

Vignon has also made some paper comparisons with IBM's new Personal System/2 Model 80 servers. "In theory, I think you would find quicker disk access time with [IBM's] Micro Channel Architecture," Vignon said.

However, he said, he chose to look at the bigger picture: "Compaq gave us the chance to do disk mirroring, something IBM never offered us."

Dumez's Systempros are

each configured with 4M bytes of system memory, Novell, Inc.'s Netware 386 software and 15 PC nodes. The networks talk to the department's IBM 4381 mainframe via IBM 3270 gateways.

Installation was no more difficult than with any other file server, Vignon claimed, and Netware was easy to load. The only trouble so far came when he accidentally tried to run a Compaq 32bit token-ring card with an incompatible Proteon, Inc. toallows users to play "what-if" games to determine the cost for a construction project. The heart of the application is a 5,000-item materials database with unit prices for everything from washers to windowpanes.

Cost savings are not the primary reason for the migration efforts. "I don't know if it will save money," Vignon admitted. "It will lower the charges on the mainframe, but we will have to invest more in PC training."

End users are actually driving



With the diverse architecture of the Louvre for inspiration, Dumez's Vignon steers construction course

ken-ring driver.

Currently, the boxes are running word processing, spreadsheet and accounting packages. Vignon will really put the processors through their paces next month when he migrates intensive payroll applications off the mainframe.

Another networking cornerstone rests on OS/2. Six members of Vignon's staff of 30 have spent 18 months developing an OS/2 version of the firm's mainframe-based cost-estimate application. By the end of the year, this program will run on the Systempro networks, as well as the firm's few PS/2 stand-alones and Toshiba America Information Systems, Inc. laptops.

The cost-estimate program

the migrations, Vignon explained. "Users want to work on a PC rather than a terminal; they want to be in a more user-friendly environment," he said.

Vignon said he does not expect the networks to replace his mainframe or even his IBM Application System/400 midrange machines. The sticking point is software — packaged construction applications are so demanding that they require machines with larger throughput capacity.

Also, Dumez's worldwide presence requires a hardware vendor with worldwide support. Dumez India opted for an AS/400 because "IBM was in New Dehli; the nearest Compaq people were only in Pakistan," Vignon said.

#### Buy-back plan reaps treasure from trash

BY JAMES DALY CW STAFF

FULLERTON, Calif. — Pity the original Macintosh. Considered a marvel of user-friendly engineering when Apple Computer, Inc. introduced it in 1984, the machine drew critical raves and a wildly enthusiastic following within weeks of its arrival.

But six years after its debut, the former toast of the industry seems a prehistoric relic. The machine's rudimentary configuration of 128K bytes of standard system memory and one floppy slot now make it seem more like a kid's toy than a serious business machine.

One man's junk, however, is another man's treasure. At least that's what Hughes Aircraft Co. is discovering.

The aeronautical equipment manufacturer has arranged a buy-back program with computer retailer Businessland, Inc. under which Hughes will trade in about 1,000 aging personal computers, including many original Macs, and get substantial credit toward the purchase of new Macintosh and IBM systems.

The swap could not come at a better time for Hughes. Like many firms in the rapidly shrinking defense industry, Hughes has become hard-pressed to cut costs and improve productivity yet prevent computer equipment from becoming obsolete.

"It's very difficult for us to justify getting rid of equipment until it breaks or is no longer usable," said Mary Howlett, a manager in the ground systems group where the trade-in will take place. "Yet a lot of our PCs are old and no longer capable of running any of the new applications coming out today."

Howlett said that credit values have been assigned to 21 different styles of computers and peripherals, including several Apple models as well as IBM Personal Computers and XTs

and assorted Hewlett-Packard Co. machines. These will be traded for Macintosh IICXs and SEs as well as IBM Personal System/2 Models 55 and 20.

After picking up the older machines, San Jose, Calif.-based Businessland will in turn resell the machines to Dana Commercial Remarketing, a nearby reseller that will refurbish the systems and sell them at cut-rate prices overseas.

ITH A buying moratorium, you
tend to get pretty creative."

JIM LAW APPLE COMPUTER

The reworking at Hughes is part of a sweeping in-house inventory rearrangement, according to Hughes purchasing manager Tom Croom. In May 1989, a computer purchase moratorium was imposed after a study reported that the employee-to-machine ratio was a bloated 2-to-1.

Suppliers soon began scrambling to keep the Hughes account alive. "With a buying moratorium, you tend to get pretty creative," said Jim Law, a national account executive at Apple, who helped arrange the buyback plan.

The buy-back plan proved to be an attractive option to higherups in Hughes management, and the moratorium was lifted for replacement parts, Howlett added.

Participants said the deal comes up with only winners: Hughes gets a savings of up to 15% over its already substantial volume discounts, Businessland maintains a high-profile presence inside Hughes through an extensive installation service plan, and Apple sells up to \$8 million worth of equipment.

# DB2 ON YOUR PC

Develop full scale DB2 applications on your PC! Join the thousands of DB2 developers already benefiting from the productivity gains provided by the XDB-COBOL Workbench for DB2.

XDB puts a 100% DB2 compatible SQL DBMS and COBOL precompiler in your PC—seamlessly integrated with Micro Focus COBOL/2 and PC-CICS for interactive development.

Multi-user development can be supported by the XDB-SQL Database Server in MS-DOS, UNIX, OS/2, and Netware 386 environments.

"The only tool available that adheres closely enough to IBM's DB2 to allow applications developed on the PC to be migrated to the mainframe with little or no modification."

PC Week June 12, 1989

"Develop on PCs... then run the finished software without changes against DB2 data on mainframes thanks to XDB's DB2-compatible database server software."

DBMS January 1990 Interested in DB2 power on a PC?

Call (301) 779-6030

XDB Systems, Inc. 7309 Baltimore Avenue College Park, MD 20740 FAX (301) 779-2429



43

1990 XDB Systams, Inc. XDB is a registered tradamark of XDB Systems, Inc. DB2 is a trademark of IBM. Other product names are trademarks of their respective holders

# As Fast As And You Can



# It Gets. Get It Fast.



The NCR PC486/MC is one fast machine. *PC/Computing* reports "the PC486/MC is on the front edge" of 486 desktops.\* With its dual high-speed

cache design, the system takes full advantage of the performance potential of the i486™ microprocessor. And its implementation of Micro Channel™ architecture makes it the clear leader in providing full 32-bit performance.

According to *BYTE* Lab benchmarks, the PC486/MC's "mass storage subsystem (with a 100MB SCSI hard drive) turned in the fastest performance we've ever measured."\*

i486 Native Design

Micro Channel Architecture

128KB Of High-Speed Cache Memory

SuperVGA Display Adapter

Small Computer System Interface (SCSI) Multi-Peripheral Controller

Worldwide Service and Support

Available Now

Our PC is the only native design 486 Micro Channel machine from a major vendor now available. We've not only released it for sale, we're delivering it in volume. The competition will eventually release a native-design 486. But how long will it be before they can deliver?

The PC486/MC is ideal for MIPS-hungry applications like large spreadsheets, financial modeling, simulations, CAD, and networking.

It's the first of a family of advanced PCs that will lead the market in speed, power, and availability.

Our PC family also includes high-performing 286<sup>™</sup> and 386<sup>™</sup>-based PCs. Backed by the resources of a \$6 billion computer company with service and support in nearly every country in the world. And a commitment to quality that is unequaled.

Call 1 800 544-3333 for a free six-page 486 PC comparison brochure. We'll also put you in touch with the NCR or Businessland representative, or other Authorized NCR Reseller nearest you.



Open, Cooperative Computing. The Strategy For Managing Change.

#### Barney FROM PAGE 39

dows' biggest pain.

Windows 3.0 also has an DOS-compatible way of addressing protected mode — in other words, it can treat up to 16M bytes of random-access memory as directly addressable linear memory. Unlike OS/2 or Unix, this mode is single-tasking-oriented. These features were pioneered by a class of products called DOS extenders.

While it is no big thing in other environments, this is an entirely new mode for Windows and the real reason that users are excited.

The third mode, pioneered by Windows/386, is called virtual mode, and it allows the user to run multiple dumb real-mode sessions simultaneously. There are a few problems, however—it only works on an Intel 80386 or I486, and it only allows users to multitask applications that work in antiquated real mode.

Because the IBM PC is single-processor-oriented, once a user begins to multitask applications of any significance, the PC will bog down anyway.

But Microsoft has some clever folks. To keep applications from bringing the otherwise snappy 80386 to its knees, they built in a time-slice scheduler. The user can determine how much processor time is allocated to each task. Then, the

IKE MANY Microsoft projects, Windows 3.0 has generated a fair share of controversy.

report for the boss can be given priority, and the spouse's newsletter can be put on the back burner, or vice versa.

Like many Microsoft projects, Windows 3.0 has generated a fair share of controversy. For years, Microsoft pooh-poohed all the so-called DOS extenders. Then Microsoft used this same technology to allow Windows applications to cleanly exceed 640K. Worse still, Microsoft created its own DOS extender, even though other vendors such as Lotus and Borland were already using proven, semistandard technologies.

This point, however, irked only the small companies. It was the very use — proprietary or not — of DOS extenders that had the big guys steaming. Lotus, for instance, has dumped an estimated \$40 million into OS/2 development with the belief that Windows would never rival its bigger graphical brother's features. Wrong.

Windows 3.0 has left firms like Lotus in the lurch. They are

stuck with tons of code for OS/2 but little for Windows, which customers finally care about.

Although some of these firms have publicly blamed Microsoft for these foibles, it is not its fault. Microsoft has passionately, zealously and relentlessly told developers to write for Windows. If any missed their opportunities . . . well, that's just too bad.

Windows 3.0 also sparked a vicious debate over the transition to OS/2 Presentation Manager. Some say that Windows 3.0, by mirroring Presentation Manager's features, will hold up the migration. That's silly. The move to Windows 3.0 can only help Presentation Manager. Both systems require an 80386 to be effective. Both need lots of RAM. And both need high-

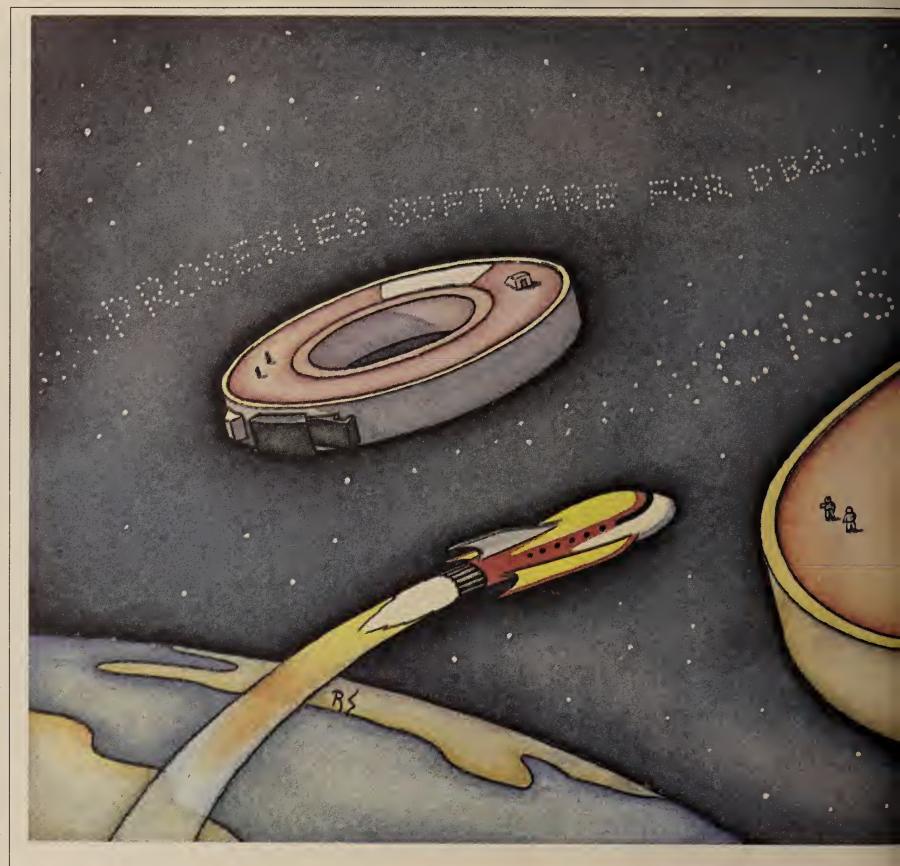
resolution graphics. You can still upgrade from Windows 3.0 to Presentation Manager.

However, while Windows 3.0 should serve many applications well, it is not up to Microsoft's more aggressive public goals, particularly as a multimedia operating environment.

Multimedia requires both multitasking (how else could you load animation, synch it to sound and add text overlays?) and a large linear address space for complex moving images.

Unfortunately for multimedia users, Windows 3.0 is only an either/or environment. However, it should have plenty to offer for most spreadsheets, databases and word processors.

Barney is editor in chief of *Amiga World*.



Soar To New Heights In CICS And DB2 Productivity. Get off to a flying start with On-Line Software's new CICS Productivity

Center and ProSeries Software for DB2.

CICS Productivity
Center was introduced to meet the five most critical needs identified by CICS shops. Unlike other "product integrations" that only offer a superficial main menu that passes control to individual products, CICS Productivity Center gives you true interaction for faster.

easier testing and debugging, quality assurance, system stability,

> application development, data recovery and on-line resource management.

ProSeries Software is a group of products that makes it easier to work

with DB2. With ProSeries you can manage DB2 objects without SQL. With its ISPF-like interface, you can test DB2 applications more efficiently. And since it also lets you embed SQL directly into

#### Oracle keeping up with the databases

BY CHARLES VON SIMSON CW STAFF

BELMONT, Calif. — Oracle Systems Corp. recently shipped its Professional Oracle Version 5.1C database and development tool kit. The newest version includes several new features that

pull the respected Oracle database server closer to the usability offered by other vendors.

"PC databases have a tough job because they have to be easy for both the software developer and the end user to use," said Allen Taylor, an independent personal computer software analyst and consultant based in Westminster, Calif. "There has been a major shift in the user base toward nontechnical people. If you don't get a sophisticated interface together, you are not going to survive."

Oracle has added a menudriven command shell that allows users to start Oracle tools and remote databases from a central control panel. The system can be preconfigured so that end users do not need to know the location of the remote database. The system can also be customized by users to function as a general-purpose DOS shell, allowing them to start applications or batch files.

Version 5.1C also supports

the Microsoft Corp. Windows 286 device driver in character mode under Windows 286.

"This is our response to demands from customers for increased ease of use," said Mark Benioff, director of Oracle's desktop products division. "The proliferation of networks is sending databases out to nontechnical business people. That is obviously a trend we want to support as much as possible."

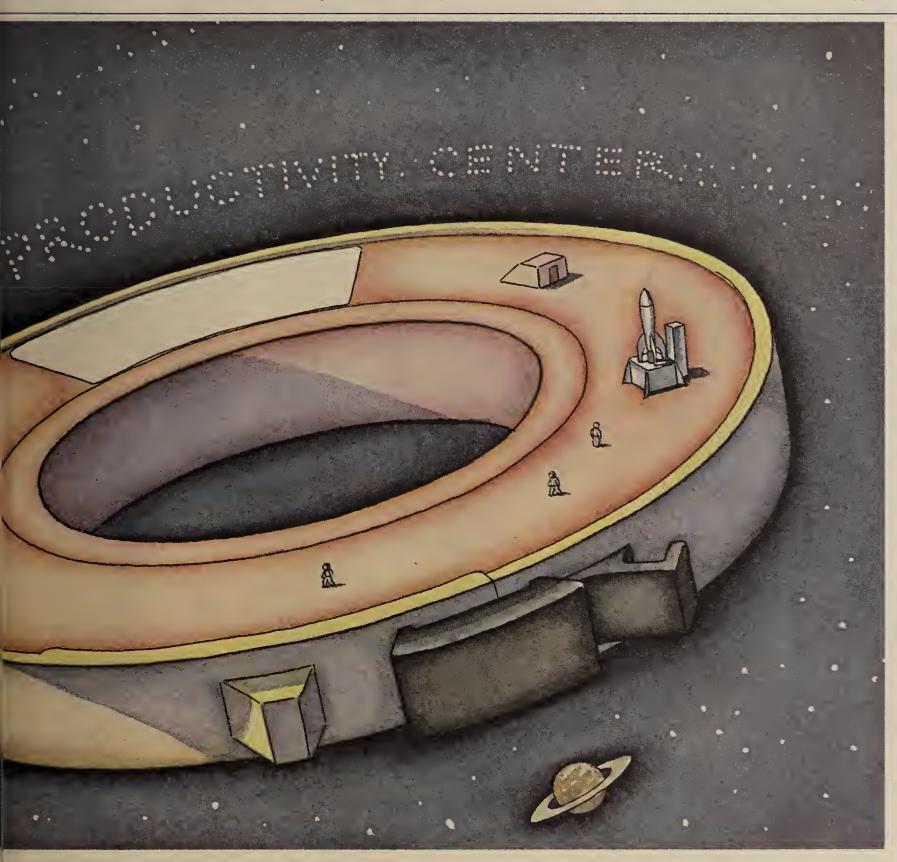
But while the system is a solid improvement over previous character-mode versions, Oracle is still behind the development effort taking place at Gupta Technologies, Inc., which has demonstrated its SQL Windows product fully supporting the Windows 3.0 character mode. Gupta is seen by most analysts as the leader in interface design.

"Gupta has a lead in graphical, menu-driven systems," Taylor said, "but given that Oracle has traditionally played to other strengths, they are making significant progress."

Oracle has not traditionally competed on the basis of ease of use, an area that is really only beginning to move into the decision process for many would-be database purchasers. The strength of the system continues to be its availability on a broader range of platforms than its competitors, making it easily portable to a range of operating systems across hardware categories.

In addition to the interface enhancements, Version 5.1C has been redesigned to include support for third-party memory managers such as Compaq Computer Corp.'s CEMM system. The new version has an improved installation procedure.

Professional Oracle Tools and Database Version 5.1C require MS-DOS 3.0 or higher, with a minimum of 640K bytes of random-access memory and a hard disk. It includes several utilities and is priced at \$1,299. Tools alone is available for \$799.



a TSO CLIST, you'll develop application prototypes and DB2 tools in half the time.

Now you can mix and match any combination of On·Line Software's CICS and DB2 productivity software for greater savings on licensing costs and maintenance fees. Imagine—The finest technology from a single reliable source, and big savings as a bonus.

So get off to a flying

start with CICS Productivity
Center and ProSeries Software
for DB2.

For more information and a free full-color poster of this ad, call 1-800-642-0177. In Canada call 201-592-0009.

Or ask about our half-day product seminars.



On·Line Software

#### The Safe Buy.

Since 1969, On-Line Software has been recognized as the premier source of CICS software, education, and consulting services. Now we've built the same reputation in DB2. And to protect our customers' investments in technology, our software is offered with the industry's first lifetime trade-in guarantee.



# My network in marketing won't share



## Now what?

The latest directive from senior management is a doozy. Marketing and manufacturing must now share applications. As for all those different PCs and systems in place, management is "confident you can meet that challenge without incurring significant additional capital expense."

Now what?

For many corporate managers, the answer to that question is 3Com® 3+Open™ systems. 3+Open systems start with LAN Manager, co-developed by 3Com and Microsoft, and include the most extensive range of connectivity and electronic mail products.

It's a powerful computing platform with the flexibility to support both current business applications and emerging client-server applications.

3+Open systems let your people share information whether they use a PC, Macintosh, IBM, DEC,



# with the network in manufacturing.



HP or Bull host. What's more, 3+Open systems are compatible with DOS, OS/2, UNIX and Macintosh applications.

To enhance your network performance and security you can run 3+Open systems on 3Com 3Servers,\* network servers designed exclusively for networks.

The result: a system that can actually leverage the value of the information anywhere in your company.

To find out how 3Com 3+Open systems are working in major corporations around the world, just call **1-800-NET-3Com**, Dept. D5014. You'll also receive a brochure on 3+Open client-server systems.

At 3Com we make internetworking products and wide area networking products, as well as adapters, operating systems and servers. Because what good is sharing along one part of the network if you can't rely on the rest of it as well?

#### 3Com

We network more types of systems to more types of systems.<sup>™</sup>

© 1990 3Coni Corporation, 3165 Kifer Road, Santa Clara, CA 95052. Telephone (408) 562-6400. 3Com, 3+Open. 3Server and the 3Com tagline are trademarks of 3Com Corporation. Macintosh is a registered trademark of Apple Computer. Inc 1BM and OS/2 are registered trademarks of International Business Machines Corporation. DEC is a registered trademark of Digital Equipment Corporation. HP is a registered trademark of Hewlett-Packard Company. UNIX is a registered trademark of AT&T. Bull is a registered trademark of Bull HN.

#### Soyring

**CONTINUED FROM PAGE 39** 

gains by going to OS/2.

Can you respond to complaints that IBM and Microsoft are confusing the industry?

I don't know of one instance where we made an announcement and changed it. Our strategy is to continue to support OS/2, and we have made our investment in that system accordingly. Our relationship with Microsoft is a strong one. As in any relationship, we will continue to evolve how we work together. Neither company has ever said [we would] hand over OS/2 development to Microsoft.

#### What about the announcements regarding Windows at Comdex/ Fall '89 in November?

When we make an announcement, it's a clear position statement. Relative to the functions that will be in Windows, we said there would be no threads, no defense security, no 32-bit model, flat addressing space or full object-oriented support these will be in OS/2 only.

Many users and OS/2 developers say you need more than 1M byte of memory — Microsoft's "design goal" — to run Windows.

As far as I know, Windows is for entry-level machines, meaning up to 2M bytes of memory and a 30M-byte hard disk. There is a large installed base of [Intel Corp.]

286 and 386 machines that have limited disk storage and real memory whose owners do not plan to upgrade those machines. Windows is a very good environment for that. It all depends on your expectations and on the memory requirements of your applications.

#### So when do you go to Windows vs. OS/2?

Windows might be fine for some limited sets of applications. But where you need preemptive multitasking and protected mode, and have applications that require a higher level of performance in the system, then go to OS/2.

How will Windows 3.0 impact OS/2?

My personal opinion is that I view Windows as a positive thing that will help sales of OS/2 by making a graphical user interface available to a larger number of users. I do think Windows 3.0 will delay some user migration to OS/2, because you now have the capability of running a [graphical user interface] on entry-level machines, as well as on more powerful machines.

Users are using Windows as a transition tool to provide a graphical user interface and a common set of applications. So from the standpoint of the cost of training users, corporations can minimize costs if [the Windows and OS/2] interfaces look similar.

Take Microsoft's Excel for Windows and Excel for OS/2 — there's a lot of synergy there. And whenever you have an entry-level configuration of a machine or system that is consistent with the high end, it helps overall sales.

#### Is there a silver bullet that will launch the OS/2 market?

No. I think [what will launch the market] is a variety of products, like [Lotus Development Corp.'s] Notes and 1-2-3/G, Excel and [IBM's] Officevision. When you start putting these applications together, you provide a powerful office environ-

#### Users and developers have complained about the limited support for DOS under OS/2.

The 32-bit version of OS/2 is very attractive. It offers a better DOS than DOS does today by providing more address space for each virtual DOS machine and expanded memory. It will allow each DOS application to run in protected mode. As for the 16-bit version of OS/2, a large percentage of [DOS] applications do run in it, despite its limitations. It hasn't been a major issue among customers.

#### Silicon Graphics drops price of Iris workstation

MOUNTAIN VIEW, Calif. - Silicon Graphics, Inc. has announced that its Personal Iris 4D/20 visual processing workstation is now available for the reduced price of \$10,000 in hopes that it will attract a larger and more diverse cross-section of creative design professionals.

Anticipating that the lower price point will allow a broader set of developers to bring their software to the Iris platform and subsequently expand the visual processing market, the vendor listed reduced component and manufacturing costs and an increased demand for volume shipments as the impetus behind the price reduction.

The system, which is aimed at the color publishing, computer-aided design and computer-aided engineering markets, allows scientists, engineers and designers to incorporate both color and real-time three-dimensional graphics into computing applications.

Silicon Graphics also announced that the price of the 4D/25S Data Station computer and file server has been reduced to \$5,900. All new pricing is reported to be effective immediately.

# Businesses have always recognized the potential of the Sun workstation. Now with Lotus, they can realize it.

The workstation has long been regarded as an incredibly powerful system. But it has lacked the one application it needed to become a major force in business.

Until now.



Announcing Lotus® 1-2-3® for Sun. The world's most advanced spreadsheet, specifically engineered for the powerful Sun workstation and the UNIX® operating system.

Lotus 1-2-3 for Sun lets you take full advantage of Sun's network environment. Making a new style of spreadsheet computing possible. With 3D spreadsheets, presentation-quality graphics, relational database capabilities and macro programmability.

Users can run several applications in different windows at the same time, linked dynamically to files anywhere on the network, for improved data access and greater efficiency.



include your existing personal com- merely like 1-2-3. It is 1-2-3. puters in the network using Sun's

PC-NFS, to further increase overall group productivity.

And like all Lotus spreadsheets, it lets you continue to use all of your

1-2-3 for Sun also lets you existing 1-2-3 files. Because it's not

Call 1-800-343-5414, ext.

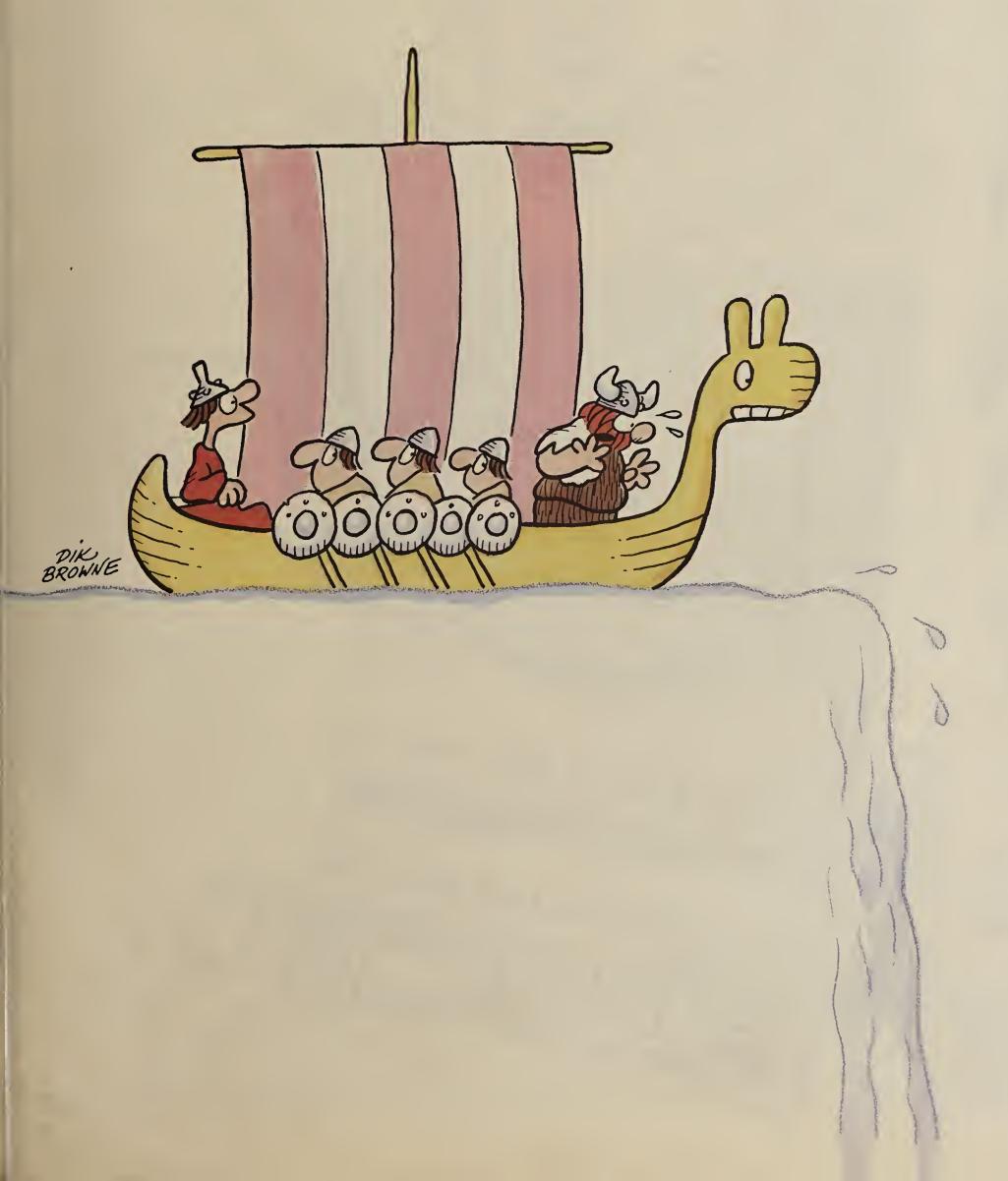
CAH-0101, to find out what 1-2-3 for Sun can do for you. After all, power like this is something your business can't afford to be without.

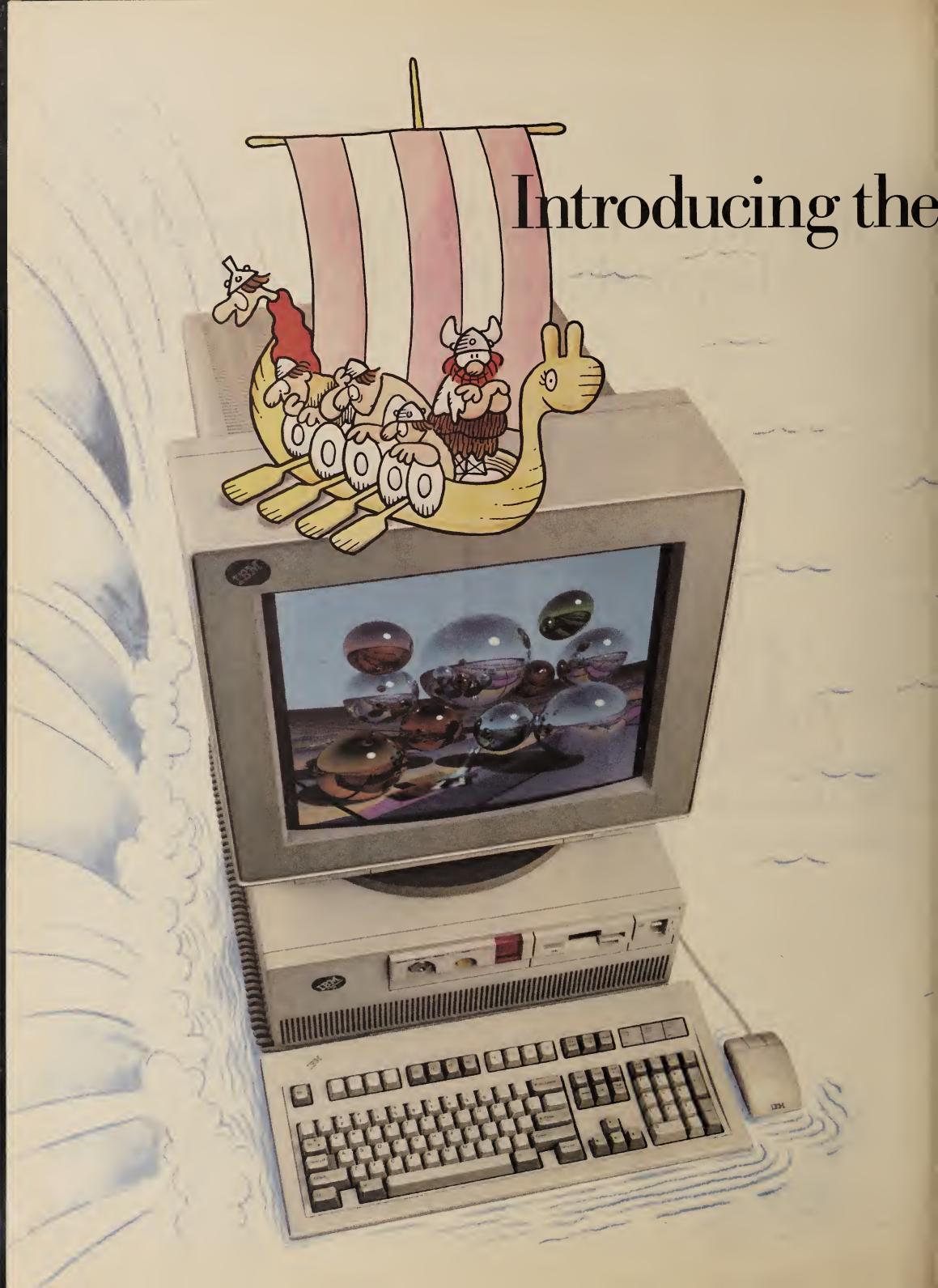




© 1990 Lotus Development Corporation. All rights reserved. Lotus and 1:2:3 are registered trademarks of Lotus Development Corporation. Sun Microsystems and PC-NFS are registered trademarks, SPARCware and the SPARCware design are trademarks of Sun Microsystems, Inc. UNIX is a registered trademark of American Telephone and Telegraph Company

# Just when Power Seekers thought they had nowhere left to go...





# IBM RISC System/6000 family.

With the most powerful desktop workstation on earth.

No matter how big the job you're setting off to eonquer, the new IBM RISC System/6000 family of POWERstations and POWERservers is for you. The desktop POWERstation 320 puts more than 7 MFLOPS and over 27 MIPS at your eommand—power that soars as high as 13 MFLOPS and 41 MIPS in other models.

What makes it possible is POWER Architecture—Performance Optimization With Enhanced RISC—IBM's second generation of RISC technology. It delivers up to four instructions per cycle and has the most powerful CMOS microprocessor in the business.

	MFLOPS	MIPS	SPECmark™
POWERstation 320 <sup>†</sup>	7.4	27.5	22.3
DECstation™ 3100 <sup>‡</sup>	1.6	14.3	10.1
SPARCstation™ 1 <sup>‡</sup>	1.4	12.5	8.4

†MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100 x 100 array suite. The Dhrystones Version 11 test results are used to compute RISC System/6000 Integer MIPS values where 1,757 Dhrystones/ second is 1 MIPS (VAX 11/780). SPECmark is a geometric mean of ten benchmark tests. 

2 Performance data are based on published benchmark information.

Micro Channel makes bottlenecks ancient history. All RISC System/6000 models feature a new implementation of the IBM Micro Channel bus with I/O throughput of up to 40 megabytes per second. And the Micro Channel Architecture can accommodate a doubling or even quadrupling of this data transfer capacity, making traditional, non-expandable architectures seem primitive by comparison.

Solid support for all UNIX® applications. These systems are all based on the industry-standard UNIX operating system. And they'll run hundreds of applications in such diverse fields as engineering design, fluid dynamics, molecular modeling, securities trading, technical publishing and geophysical modeling, plus a wide selection of commercial applications.

"The POWERstation 320 comes with 8MB of RAM, 120MB of disk, 19-inch grayscale display and graphics adapter, keyboard, mouse, Ethernet" adapter, AIX operating system, user interface environment. NFS" and hypertext documentation search and retrieval capability

A brave new world of 3D graphics. All our POWERstations are built to deliver high-speed, high-resolution graphies. Our 3D processors offer an almost unimaginable palette of 16 million colors. And our new Supergraphies POWERstation 730 gives you 3D graphies eapabilities that are really out of this world, performing nearly one million 3D vector transformations per second.

AIX™ brings different worlds together. Every model ean eome preloaded with AIX Version 3, IBM's version of the UNIX operating system. It supports major industry standards, like POSIX™ and TCP/IP, plus the programming languages C, FORTRAN, COBOL and Paseal. And AIX allows the RISC System/6000 family to fit into your installed UNIX base, as well as your IBM SAA™ environments, giving you the best of both worlds.

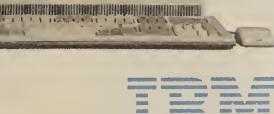
Supercomputer speed at a workstation price: \$12,995. Our entry desktop POWER-station 320 starts at \$12,995 eomplete.\* And every member of the RISC System/6000 family eomes with software service at no extra charge and a 12-month warranty.

The worldwide support of IBM. Then, of eourse, there's IBM service when you need it, 24 hours a day, 365 days a year. To find out more, eall your IBM marketing representative

or Business Partner. For literature, eall 1 800 IBM-2468, ext. 225. And find out why it's the beginning of a new world for Power Seekers.







### Computer show to strike Moscow

FRAMINGHAM, Mass. — The Soviet Union, perhaps the world's largest untapped computer market, will open up July 10-15 to Western personal computer vendors in Moscow when International Data Group's World Expo Corp. hosts 50,000 Soviet officials and business professionals with hard currency to spend on PCs and software at PC World Forum/ Moscow.

The exposition is the only certified U.S. Department of Commerce trade show to be held in the Soviet Union this year. PC World Forum/Moscow will also be the first chance for Soviet software developers to meet with international vendors and development experts.

Once the expected changes in intellectual property laws are passed, Soviet software is expected to be a major form of countertrade.

Although the Soviet Union has only 300,000 PCs, Moscow officials predict demand will reach 28 million by the year 2000; considering existing Soviet production facilities, the majority of those systems will have to be imported.

The opening two days of the show are reserved exclusively for Soviet executives identified as volume buyers.

Included among the speakers at the July 11-12 Software Development Conference will be Bradley Homes, director of the U.S. State Department's Bureau of International Communications and Information Policy; Bernard Vergnis, vice-president of Microsoft Europe; and Esther Dyson, an industry consultant.

#### MICRO NOTES

## PC base doubles in Fortune 1,000

The average multisite Fortune 1,000 corporation had installed 2,287 personal computers by the end of 1989, a 133% growth rate from 1987, according to a recent study by **Computer Intelligence**. A similar survey that had been conducted in 1988 showed an average installation of only 982 PCs per company by the end of 1987

The PC growth rate was found to vary among vertical markets, ranging from a low of 48% in the life insurance sector to a high of 230% in the diversified services segment.

CI also said that these organizations are on average planning to purchase another 185 PCs this year. The survey is based on interviews with 26,900 sites associated with 949 of the Fortune 1,000.

McDonnell Douglas Corp. will resell Hewlett-Packard Co.'s reduced instruction set computing-based 9000 workstations under a three-year, \$75 million value-added reseller agreement signed by the two companies last week. McDonnell Douglas will package its own Unigraphics software on the HP platforms and said that it will continue to target the computer-aided design/computer-aided manufacturing market, in which it has successfully teamed with HP in the past.

#### Dial-a-DOS from Microsoft

BY CHARLES VON SIMSON

REDMOND, Wash. — Microsoft Corp. has established a 900 number to provide MS-DOS technical information that evaluates the potential for turning a profit from telephone service. The process is the first for a major software vendor, but several others are expected to follow.

"Up until now, 900 numbers have meant dial-a-porn and other silly stuff," said Richard Farmer, director of systems and marketing in the product support services unit at Microsoft.

In the near term, the 900 number will

provide information and technical support to DOS customers for \$2 per minute. Farmer said he expects that the 900 service will break even, but he is looking for profit opportunities in other areas. In the long run, the current service will provide a laboratory for testing the service and marketing possibilities of 900 numbers.

Farmer said that the system was running near capacity but that customers were experiencing no delays in reaching the eight technicians staffing the phones. A sample call placed by *Computerworld* was answered promptly.

Because Microsoft licenses DOS only to OEMs, product support has traditional-

ly been the responsibility of equipment manufacturers. The distribution channel, however, is coming under pressure from software publishers. "Resellers and dealers simply don't provide the level of support that customers need," Farmer said. "We will study the ways customers use the service to look at the best value-add potential."

Microsoft will also look at the potential for telephone consulting on more sophisticated topics such as systems development and billing for its expertise. "There is simply no good research on how people will use this kind of information or what they will pay for it," Farmer said.

Lotus Development Corp. and Aldus Corp. have said they, too, will offer 900-number customer support.



#### This is what typically happens to people about

It starts almost immediately. You see menu commands you already know. Which, to a Lotus® 1-2-3® user, is a comforting sight. You use the familiar 1-2-3 keystrokes. No surprises there. You realize that it feels like 1-2-3 because it is.

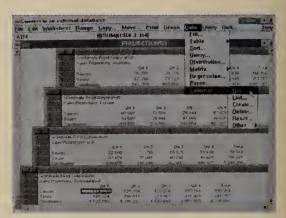
But wait, there's a mouse. And pull down menus and dialog boxes and a WYSIWYG display. Which is where things suddenly start getting exciting.

Like 1-2-3 Release 3, 1-2-3/G<sup>™</sup> offers true 3D worksheets, file-linking, direct access to external databases, and network support. And through its

graphical user interface, plus a host of new features, 1-2-3/G becomes a powerful analytical tool that is extremely easy to use and responsive to the way you work.

You discover an exciting new feature called Solver, an advanced goal-seeking technology that gives you an amazing short-cut to solve complex "what-if" business problems. In seconds, Solver shows you "how-to" achieve your desired results, based on the variables and constraints you put into your spreadsheet.

And when you're ready to present your results, you'll find a



Whether it's working with a 3D file or bringing in information from external databases, the power of 1-2-3/G is always within reach.

variety of dramatic new graphing capabilities that will help you make your point with clarity and impact.

Plus, 1-2-3/G takes advantage of the speed, large memory, and multi-

©Copyright 1990 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are

#### NEW PRODUCTS

#### **Macintosh products**

Microtech International, Inc. has announced a 16M-byte memory upgrade package for Apple Computer, Inc. Macintosh systems.

The package consists of Microtech's 4M-byte single LU line memory modules and Maxima, a memory management software product from Connectix Corp. The bundled product enables Macintosh users to use graphics and audio editing programs as well as perform large database and spreadsheet tasks.

The list price is \$699 per module.

Standard modules are available for the SE/30 and Mac IICX and IICI units.

Microtech 158 Commerce St. E. Haven, Conn. 06512 203-468-6223

Fontina, a software product that improves font menus in Apple Computer, Inc. Macintosh programs, has been announced by Eastgate Systems, Inc.

The product upgrades Macintosh system software so that multicolumn menus are used instead of scrolling fonts, the vendor said. The software includes a feature in which related font families are

grouped together and allows for all installed fonts to be displayed at once.

Fontina has a retail price of \$69.95. A complete office package that includes 10 copies of the program is available for \$295.

Eastgate P.O. Box 1307 Cambridge, Mass. 02238 617-924-9044

#### Software utilities

Invisible Software, Inc. has begun shipping an expanded memory manager for Intel Corp. 80386-based personal computers.

Invisible RAM 386 reportedly uses the 80386 chip's built-in memory manage-

ment functions to create shadow random-access memory and boost DOS memory from 640K bytes to 704K bytes on monochrome systems or up to 736K bytes on color systems.

The product also supports applications programs designed for Lotus Development Corp., Intel and Microsoft Corp.'s Expanded Memory Specification Version 4.0. Invisible RAM 386 costs \$59.

ISI Suite D 1165 Chess Drive Foster City, Calif. 94404 415-570-5967

#### Systems

Square 3 Extra, an addition to Reason Technology's line of Intel Corp. 80386-based business computers, combines a 25-MHz 386 processor with 8M bytes of random-access memory in a small footprint system.

It incorporates an IBM Video Graphics Array-compatible graphics card, a color monitor, a 200M-byte, 15-msec 3½-in. hard drive with 64K bytes of cache memory, a 1.2M-byte floppy drive, two serial and one parallel ports and eight expansion slots. Its hard drive features data transfer rates of more than 1M bit/sec.

The system's introductory price of \$3,695 includes a one-year warranty and a 30-day, money-back guarantee.

Reason Technology 290 Coon Rapids Blvd. Minneapolis, Minn. 55433 612-780-4792



Square 3 Extra extends Reason Technology's 386-based business line

CCS Custom Computer Systems, Inc. has announced a computer system that has been built around a Mylex Corp. mother-board

The CCS:38625C personal computer uses the Mylex MWS386-25 IBM AT form-factor motherboard to incorporate cache random-access memory architecture using 64K bytes of 25-nsec static RAM. The suggested list price ranges from \$4,500 to \$10,000, depending on hardware configuration.

CCS 191 Woodport Road Sparta, N.J. 07871 201-729-6762

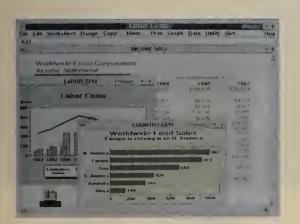
Fortron/Source has introduced the Netset 386SX, a 16-MHz Intel Corp. 80386SX-based system that can handle 32-bit software applications.

The system can be expanded to contain 8M bytes of random-access memory and can incorporate an Intel 8387SX coprocessor when needed.

The system sells for \$1,295.

Fortron 6818-G Patterson Road Livermore, Calif. 94550 415-373-1008

#### 3 minutes into a 1-2-3/G product demo.



1-2-3/G allows you to look at your graphs and spreadsheets simultaneously, and lets you customize them with fonts, colors and borders.

tasking capabilities of OS/2®. And it supports Dynamic Data Exchange, enabling you to swap live data between 1-2-3/G and other OS/2 applications for true application integration.

Not surprisingly, 1-2-3/G received the Best Software Product award at its Comdex preview last fall. And PC World has called it a "new high in spreadsheet technology."

But now it's time to experience it for yourself.

For a free auto-demo or brochure call 1-800-842-8455, ext. 451. And see why your analytical power isn't the only thing 1-2-3/G will elevate.



Call 1-800-842-8455 extension 451

#### Introducing the new Lotus 1-2-3/G

registered trademarks and 1-2-3/G is a trademark of Lotus Development Corporation. OS/2 is a registered trademark of International Business Machines Corporation.

If you're a current 1-2-3 user and would like a 1-2-3/G Upgrade Ordering Kit, please call I-800-TRADE UP.

You're looking at your largest technology investment. What a shame you've had to expend most of it working around the limitations of conventional databases.

Fortunately, Ingres has changed all that by introducing the first intelligent database.

We call it intelligent because it helps organizations operate more intelligently. In short, it gives you the ability to manage not just data, but knowledge and objects as well.

The unique Ingres Knowledge Management<sup>™</sup> facility lets you manage business policies or

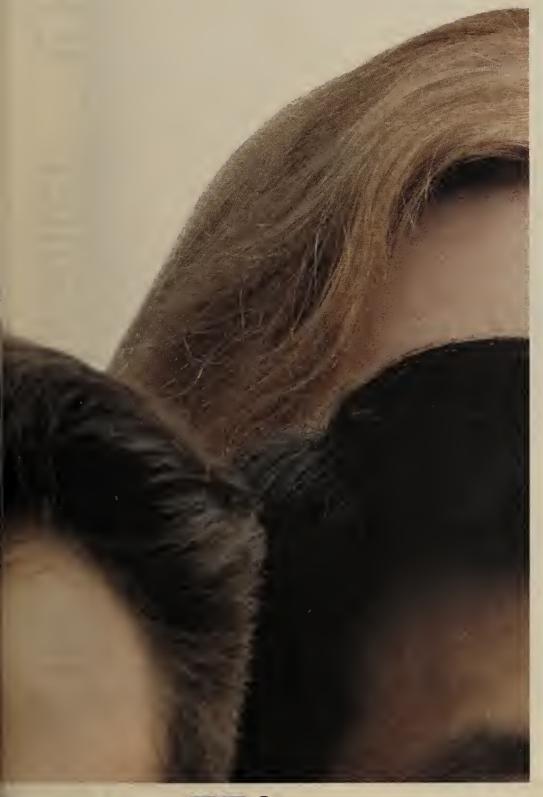
1080 Marina Village Pkwy, Alameda CA 94501 (Corp. Headquarters) • 1801 Rockville Pike, Suite 200, Rockville MD 20852 • 5650 Yonge St., Suite 1700, North York, Ontario M2M 4G3. Ingres, Intelligent Database,



# Finally. A database to free-up all this variables

rules—and referential integrities—inside the database server. Because this information is centrally enforced and managed, you get complete control of your data and its integrity. And your programmers don't have to write rules and referential integrities in each application.

dge Management and Object Management are trademarks of Ingres Corporation. © 1990 Ingres Corporation.



An unlimited number of rules can be stored in the server. And features like unlimited forward chaining and recursion mean that rules fire when expected.

Ingres Object Management gives you the ability to manage types of data that are difficult or impossible for conventional databases. User-defined datatypes—like geographic coordinates or manufacturing tolerances—are stored and used within the database server. They can even be manipulated using standard SQL.

Rather than wasting time converting data to fit the constraints of your database, you can teach your database to understand data the way your organization uses it. So your data becomes more relevant to how you do business, and your database more useful than ever.

And as if this weren't enough, the Intelligent Database™ also features improved data management capabilities, giving you enhanced performance for OLTP, decision support and distributed processing.

The net result: the Ingres Intelligent
Database lets you model the real world—your
business—like no other database in existence.

So remember. When you want to get the most out of your most valuable hardware, you have only one intelligent choice.

Call 1-800-4-INGRES to find out more.



Intelligent database. Intelligent decision.

# ntelligent enough luable hardware.

#### Software applications packages

Chipsoft, Inc. has released the Massachusetts version of Turbotax for the IBM Personal Computer XT, AT, Personal System/2 and compatibles.

The product reads data from the Turbotax federal data file and uses information from the Turbotax 1040 software package. Once the software is loaded on a computer, users can work on federal and state forms simultaneously by switching back and forth, the vendor said. On-line Help screens and a tax smarts feature are included.

The Massachusetts version of Turbotax requires Turbotax Federal Personal

Version 7.01 to operate. The package sells for \$40 with annual updates of \$25. Chipsoft

5045 Shoreham Place San Diego, Calif. 92122 619-453-8722

Eastman Kodak Co. has announced its advanced printing and publishing software Release 1.1 for the Sun Microsystems, Inc. Sun-3, Sun-4, and Scalable Processor Architecture environments.

The product's open, modular design enables users to run a customized mix of publishing and nonpublishing applications in a standard Sun Windows environment. The software allows multiple applications to be run simultaneously and multiple sessions of an individual application to be run concurrently, the vendor said.

The price for a package that includes four modules is \$4,000.

Kodak 901 Elmgrove Road Rochester, N.Y. 14653 716-253-0053

#### **Training**

Intellisance Corp. has announced Training for PC-DOS, an interactive computer-based training package offered in single-user and local-area network versions.

The product covers all DOS versions, including 4.0, and is designed to enable users with little or no personal computer experience to learn the basics of working with disks, disk files, tree-structured di-

rectories and fixed disks.

The package is being offered for \$179.95 per unit. Volume discounts are available.

Intellisance 1885 Lundy Ave. San Jose, Calif. 95131 408-432-0430

#### **Development tools**

Genesis Software Co. has announced a new version of a productivity tool for Cobol programmers and analysts.

Version 1.0 of WS-Report provides Cobol programmers with an interactive editor to create report layouts, documentation editors, formatted mock-up facilities and a working-storage code generator

The product requires 384K bytes of memory and runs on DOS 3.0 or higher. It is priced at less than \$200 per copy.

Genesis P.O. Box 923 Cypress, Texas 77429 713-469-5753

Sun Microsystems, Inc. has introduced Sunvision, a software package that includes visualization tools and libraries designed for use on its Scalable Processor Architecture (Sparc)-based workstations.

Sunvision provides users with image processing, volume rendering and photorealistic rendering capabilities for Sun's Open Windows application environments. It includes two programming interfaces for developing software for Sparc-based systems, an image processing library and a renderer.

Sunvision is slated to begin shipping in late July with a price tag of \$3,000.

Sun 2550 Garcia Ave. Mountain View, Calif. 94043 415-960-1300

#### **Peripherals**

Mouse Systems Corp. has announced a bundled software package that includes its PC Mouse and PC Mouse II high-end optical input mouse products and its Cad-One stand-alone software program.

Cad-One is an all-purpose drawing and computer-aided design tool that allows users to select a specific drawing size and unit of measure before beginning a drawing

The price for a bundled package that includes Cad-One and PC Mouse or PC Mouse II sells for \$169.

Mouse Systems 47505 Seabridge Drive Fremont, Calif. 94538 415-656-1117

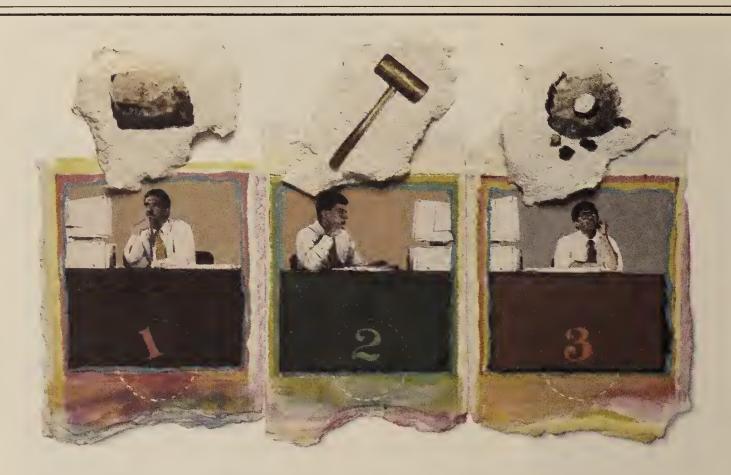
HSD Microcomputer U.S., Inc. has announced a scanner that is compatible with the Next Computer System from Next, Inc.

Scan-X 1600 features 1,600-dot/in. scan resolution for line art and 400 dot/in. for gray-scale images. The scanner also recognizes 256 shades of gray.

The Scan-X 1600 System supports Tag Image File Format. It includes the scanner, small computer systems interface kit and Scan-X software.

The system is available through Businessland, Inc. at a retail price of \$4,995.

HSD Microcomputer 2000 Broadway Redwood City, Calif. 94063 415-367-1797



# Lotus 1-2-3/M helps people combine their efforts instead of duplicating them.

Lotus® 1-2-3® has given people throughout your organization a more productive way to use their PCs. But they've never been able to fully exploit the advantages of working together. Because they've lacked the one application that could connect their PCs and unite them with the resources of the mainframe.

Presenting Lotus 1-2-3/M™—the Hub of Enterprise Spreadsheet Computing. Now everyone in your organization can work together building 1-2-3 applications that can span your entire enterprise.

In a partnership between IBM LOUS and Lotus, 1-2-3/M has been designed specifically to take full advantage of the power and networking capabilities of the System/370™ environment. So data from PCs and the mainframe can be consolidated into a master spreadsheet, whether people are working next door or around the world.

The DataLens<sup>™</sup> architecture of 1-2-3/M provides direct access to both DB2<sup>™</sup> and SQL/DS. Users can query and retrieve data directly into their worksheets, without having to learn a database language. What's more, with The Lotus Spreadsheet Connection, information can easily be exchanged between PCs and the mainframe.

And 1-2-3/M isn't merely like 1-2-3. It is 1-2-3. That means your current investment is protected, because it offers application portability and full file compatibility with previous and current releases of 1-2-3. And applications developed on the PC will also run on the mainframe, including formulas and macros. So your people can get to work right away.

For more information, call your IBM Marketing Representative or **1-800-343-5414**, at extension CBR-0103. After all, people work better once they're able to work together.

Introducing Lotus 1-2-3/M

© 1990 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks and 1-2-3/M and DataLens are trademarks of Lotus Development Corporation. IBM and the IBM logo are registered trademarks, System/370 and DB2 are trademarks of International Business Machines Corporation.

# HOW NAPOLEON WON THE BATTLE OF WATERLOO.



ON FEBRUARY 26, 1815, NAPOLEON BONAPARTE set sail for France from his exile on the island of Elba. His mission was to restore constitutional rule to his adopted land, an idea that other European monarchs had vowed to fight to the death.

After landing at Antibes on March 1st, he set about preparing for war. A war that would culminate near the tiny Belgian village of Waterloo.

Napoleon knew that, to prevail, he would need to strike first. And he knew that such a tactic would require precise information and an effective way to analyze it. But, with limited resources and little time, a mainframe computer system was out of the question.

Then an aide alerted him to the ideal alternative. Open systems information process-

ing software from Informix.

At the heart of the solution was INFORMIX® OnLine, the first mainframe replacement database management system.

BEFORE EVEN ONE SHOT WAS FIRED, Napoleon relied on OnLine's high capacity to direct the flow of troops and materiel.

OnLine's distributed computing power meant he could successfully avoid information bottlenecks while thousands of transactions were processed at outposts throughout France every minute of every day.

Napoleon soon learned that OnLine could do something no main-



BINED THE WINGZ HYPERSCRIPT\* PROGRAM-MING LANGUAGE WITH DATALINK TO CREATE A CUSTOMIZED EXECUTIVE INFORMATION SYSTEM THAT COULD EASILY RETRIEVE SQL DATA BY CLICKING ON-SCREEN BUTTONS. NAPOLEON USED THIS SYSTEM TO ANALYZE EVERY-THING FROM WELLINGTON'S TACTICAL PREFERENCES TO HIS SOCIAL SCHEDULE THE NIGHT BEFORE BATTLE.



EARLY MAPS OF THE PERIOD INDICATE THAT THE FRENCH HELD A TREMENDOUS EDGE OVER THEIR ENEMIES. THE PERFORMANCE, CAPACITY AND RELIABILITY OF INFORMIX-ONLINE MAIN-FRAME REPLACEMENT SOFTWARE, WITH INFORMIX DATABASE SOFTWARE RUNNING ON VIRTUALLY EVERY UNIX\* SYSTEM. NAPOLEON WAS ABLE TO CHOOSE THE MOST COST-EFFECTIVE HARDWARE CONFIGURATION FOR EVERY LOCATION AND APPLICATION. NOTHING BUT MUCH LARGER AND MUCH MORE EXPENSIVE SYSTEMS HAD EVER APPROACHED THIS SOLUTION IN THE PAST. Profile

Profile

Clinylen

Ington's attitude
Ington's attitude
Infamiliarity with
Infami

USING EITHER WINGZ ON
GRAPHICAL PC'S, OR
SMARTWARE' ON DOS
MACHINES, NAPOLEON'S
STAFF COULD EASILY
ANALYZE DATA AND
PRODUCE REPORTS THAT
COMBINED TEXT, GRAPHS
AND DATA, ALL ON
ONE PAGE,

Strength of the Allied Army

HISTORIANS NOTE THAT
NAPOLEON HIMSELF KNEW
LITTLE OF COMPUTERS.
BUT WITH WINGZ DATALINK,
THE INFORMIX-ONLINE
DATABASE BECAME AS EASY
TO USE AS A SPREADSHEET.

frame could. Its multimedia feature meant he could store data in virtually any form. Including reconnaissance photos. Three dimensional maps. Multi-colored charts. Even clandestine sound recordings collected by his intelligence network.

WITHIN THREE MONTHS, THE FRENCH COmmander had amassed an army of 120,000 men, supported by 246 pieces of artillery. The opposition would be a far greater allied force comprised of British, Dutch, Belgian and Prussian troops, led by the Duke

of Wellington.

But, while Wellington's staff struggled with traditional database systems that required experts and hours of work to generate reports, Napoleon's cadre had instant access to information through Wingz™ DataLink and INFORMIX-OnLine.

Historians acknowledge that this Executive Information System was perhaps the most formidable weapon in the French arsenal.

ON THE EVENING OF JUNE 16th, NAPOLEON led his army across the Sambre River into

Belgium, established headquarters at Beaumont and began his analysis.

As early reports came in, his strategic responses were transmitted to the field.

AT ELEVEN O'CLOCK ON THE MORNING OF the 18th, Napoleon rose from a brief nap and

THE LOYALTY OF NAPOLEON'S STAFF DID NOT EXTEND TO THEIR CHOICE OF HARDWARE. HEADQUARTERS WAS EQUIPPED WITH A VARIETY OF UNIX SERVERS. COMMANDERS IN THE FIELD SELECTED THEIR INCLUDING THOSE FROM SUN, IBM, APPLE, HEWLETT-PACKARD, DATA GENERAL. DEC AND NEXT. FORTUNATELY, NAPOLEON'S CHIEF INFORMATION INFORMIX DBMS PRODUCTS RAN ON MORE THAN 450 DIFFERENT COMPUTERS. WHILE WINGZ SUPPORTED ALL THE MAJOR GRAPHICAL USER INTERFACES. FROM MACINTOSH, PRESENTA-TION MANAGER AND MICRO-SOFT WINDOWS TO MOTIF. OPEN LOOK AND NEXTSTEP.



gave the order for his guns to blaze. What followed is now recognized as one of the most ferocious battles in military history.

Less than two hours into the fighting, more than 300,000 men were engaged in hand-to-hand combat on a battlefield that was just four miles square.

The key moment came just before dusk. Napoleon used Wingz with OnLine to run a simulation projecting Wellington's casualty rate and chose to deliver the coup de grâce.

The order went out to let loose five batallions of the elite Old Guard. Charging into the fray, they crushed what remained of the enemy's resolve.

Looking out over the victorious ranks, Napoleon Bonaparte raised a glass of his most precious cognac, turned to Marshall Ney, and uttered the now-famous words, "What a glorious day for France."



"QUEL JOUR GLORIEUX POUR LA FRANCE"

INFORMIX PROVIDES SOLUTIONS THAT ORGANIZATIONS SUCH AS HYATT HOTELS, MERRILL LYNCH, US WEST, GENERAL MOTORS, SEARS, CHARTERHOUSE BANK, DOMINO'S PIZZA, ANHEUSER BUSCH, DHL, K-MART, GENERAL DYNAMICS, AND GOVERNMENTS AROUND THE WORLD DEPEND ON EVERY DAY. • SOLUTIONS BEING SOLD AROUND THE WORLD BY STRATEGIC PARTNERS LIKE AT&T, BULL, DATA GENERAL, DEC, FUJITSU, HEWLETT-PACKARD, INTERGRAPH, IBM, NCR, PHILLIPS, PYRAMID, SEQUENT, SIEMENS, AND UNISYS. • IF YOU WOULD LIKE MORE INFORMATION AND A FREE, FULL COLOR REPRINT OF THIS ADVERTISEMENT, PLEASE CALL INFORMIX SOFTWARE AT 1-800-331-1763, EXTENSION 1000. CALL TODAY.

ALL COMPANY NAMES AND LOGOS ARE REGISTERED TRADEMARKS OF THE INDIVIDUAL COMPANIES





SIMULATION USING THE
MULTI-MEDIA INFORMATION
STORED IN HIS INFORMIXONLINE DATABASE.
NAPOLEON KNEW THE
PRECISE MOMENT HAD
ARRIVED. ASTRIDE HIS WHITE
MARE DESIREÉ, HE LED
THE FINAL CHARGE.

### NETWORKING

Jeffrey Fritz

#### When a LAN is not a LAN



Lately, there has been talk about using Integrated Services Digital Network (ISDN) technology as a

cal-area network. While ISDN loes support certain services hat can be deployed in a LANke manner, ISDN cannot relace high-production networks sing Ethernet or token-ring.

ISDN simply doesn't suport the speeds or offer the deree of service that are found n most conventional LANs. However, there are times when SDN can serve as a virtual LAN, lelivering LAN-like services in unique way.

One of ISDN's nicest feaires is its ability to support fast all setup. Compared with anaog connection time, ISDN is ghtning-fast. An end-to-end onnection can be set up in less han 600 msec. ISDN can also onnect to a wide variety of desinations at respectable speeds. berial devices such as printers, modems and other personal omputers can be connected to SDN terminal adapters and hared by several users. This sually requires the user to lace a data call to the desired evice's destination number,

Continued on page 63

### Unisys offers network support

BY ELLIS BOOKER CW STAFF

BLUE BELL, Pa. - Laying claim to six years of experience building local-area networks. Unisys Corp. recently introduced Connect, a five-phase program to plan, design, install and maintain LANs.

Unisys will act as a single point of contact for LAN customers, maintaining its own equipment and software as well as that of other vendors.

Last October, Hewlett-Packard Co. introduced a comparable service called HP PC-LAN Sup-

port. Digital Equipment Corp. also has a LAN support offering.

"I think everyone should be in this business . . . if they want to stay in business. The opportunities today are in networking and LANs. They're complex, vital," said Don Goodspeed, vice-president at Westport, Conn.-based Meta Group, Inc.

Goodspeed was less sure of Unisys' ability to sell the service outside of its existing customer base, but he welcomed the thoroughness of the five-phase Unisys offering.

Maintenance and support contracts for its computer customers already account for about one-quarter of Unisys' revenue, said Unisys director of services market development Joseph Zeccardi, who estimated the market for value-added network planning and support services at \$2 billion annually.

Unisys will initially support LANs using Novell, Inc.'s Netware, which it has been selling under the name Usernet since 1984.

By the end of the year, Unisys plans to have 160 certified network engineers dedicated to the LAN services organization. The company will eventually have 200 of these engineers, who will be supported by its existing staff of 4,000 to 5,000 customer service engineers, company officials

Pricing for Connect will depend on the particular contract. However, these prices will be "competitive" with what LAN manufacturers charge for such services — in the \$100 to \$200 per hour range, Zeccardi said.

Zeccardi noted, "In addition to planning, design and installation, we will also take full responsibility for hardware and software content." The Unisys Surety Service Program will offer various levels of maintenance and support for the LAN and all its attached devices. Also, as part of ongoing service, Unisys said it will periodically visit its LAN customers to check the performance of their networks.

#### FEATURE: CUSTOMER-CARRIER RELATIONS

#### Catching users in public nets

BY JOANIE M. WEXLER CW STAFF

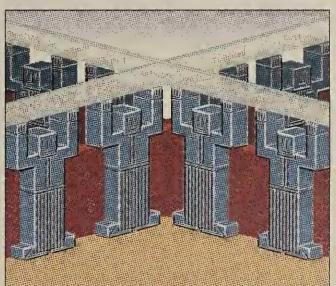
he postdivestiture dust has settled, leaving corporate telecommunications professionals confident in the expertise and survival of multiple communications carriers in a competitive world. In the aftermath, interexchange carriers have been able to woo many customers back to public networks with economical enhanced services once available only through private solutions.

Many large companies now consider their interexchange carriers strategic partners in planning and building corporate networks. Recognizing that carrier resumes are brimming with networking talent, users are easing up on their postdivesti-

ture doggedness to handle every wire, jack and port in-house.

Notes Tom Pollando, corporate director of communications at Paine Webber, Inc., an AT&T Tariff 12 customer: "As a manager, I want the most talented people I can find running my network. It's the long-distance carriers who are at the leading edge in communications."

Carriers are becoming more flexible in ac-



commodating individual company needs via volume discounts, custom-designed networks, virtual private networks and fractional T1. Also, software-defined network management services give users control over their networks previously offered only by private T1 switches.

"Economics are the main reason users migrate back to public networking," says Tom Nolle, president of CIMI Corp., a communica-

Continued on page 62

# New Version

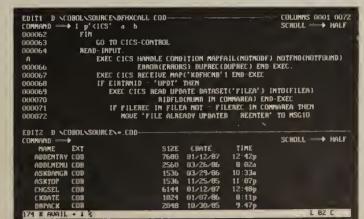
# ero Learning Curr

The MVS programmer will feel right at home using SPF/PC, the only PC editor functionally equivalent to editing on the IBM mainframe with ISPF/PDF, Release 2, Version 2.

SPF/PC fills the mainframe user's needs with a familiar environment, commands, large file support and micro-to-mainframe file portability. SPF/PC also offers:

- true split screen
- command stacking
- 43-line EGA
- picture strings
- online help
- directory/member lists
  - hexadecimal editing

  - 50-line VGA
  - user interface
  - utilities
- network support binary editing



SPF/PC includes many PC-productivity features to save time and keystrokes, such as direct access to BROWSE and EDIT directory lists from the DOS prompt.

Want proof? Ask us for a FREE, interactive demonstration diskette.

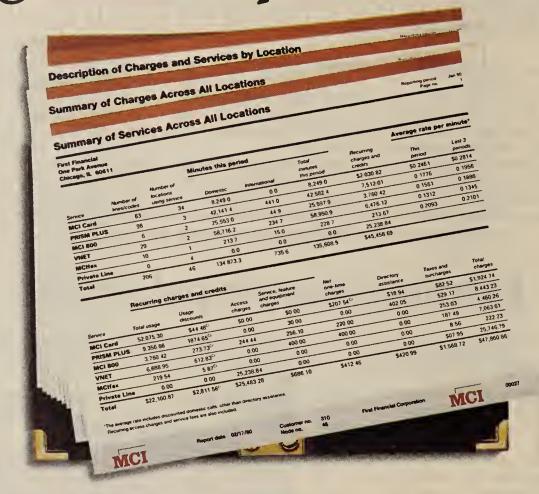
SPF/PC — so much like the real thing, you'll forget you're editing on a PC.



Command Technology Corporation

1040 Manna Village Pkwy, Alameda, CA 94501 (415) 521-5900 Orders: (800) 336-3320 FAX: (415) 521-0369 Telex: 509330 CTC

Introducing the telecommunications management report so advanced



it deserves the world's most advanced demonstration.



#### Call, fax or send for your free demonstration disk.

If you're tired of sifting through endless phone bills from all your locations, you need MCI Portfolio.<sup>SM</sup>

Our free demonstration disk shows why Portfolio is the most comprehensive telecommunications management report available today.

Portfolio integrates the information you need from a wide range of MCI® services and from all your locations into a single, concise report. It lets you develop a completely individualized reporting format that mirrors your company's structure. Now you can tailor your report to meet corporate, divisional and branch office needs.

See why better telecommunications reporting means better cost control for your whole company.

Call 1-800-765-0088, fax 1-800-753-0088



Yes! Please send me my free MCI Portfolio demonstration disk.
Name(Please Print)
Address
City State Zip
Business Phone Number ()
Average monthly phone bill  Mail to: MCI PORTFOLIO DISK, 230 Schilling Plaza South  3rd Floor, Hunt Valley, Maryland 21031

#### Primary Access aims to pare down dial-up access

BY JOANIE M. WEXLER

SAN DIEGO — A product that could replace the jumble of equipment in the asynchronous dial-up environment with one multifunction device was introduced last week by start-up Primary Access Corp.

Called Primary Access, the system integrates the function of modems, channel banks, packet assembler/disassemblers (PAD), channel service units, local-area network servers and Integrated Services Digital Network terminal adapters into a software-based, modular system containing T1, fractional T1 and other interfaces.

Control and management of the functions and interfaces are provided by a centralized personal computer-based system called Primary View.

# Novell beefs up Mac ties

Novell, Inc. recently made three announcements, each intended to bolster the local-area network manufacturer's stake in the world of the Apple Computer, Inc. Macintosh.

The Provo, Utah-based company last month announced the release of LAN Workplace for Macintosh Version 1.1. The update offers new features for Macintosh owners using Novell Netware products.

Macintosh Workplace 1.1 includes 12 European alphabets, a larger screen display, Telnet terminal emulation and print-screen capability. The print-screen ability allows users to print portions of Telnet sessions with mouse functions. The software, which is priced at \$250, includes support for File Transfer Protocol, Transmission Control Protocol/Internet Protocol (TCP/IP) software and network monitoring software.

#### Shiva gets Fastpath license

At the same time, Novell announced the licensing of Fastpath, its Macintosh gateway product, to Cambridge, Mass.-based Shiva Corp. Novell picked up greater Macintosh connectivity expertise from its merger with Excelan, Inc. in June 1989.

Shiva specializes in Macintosh networking software and hardware. Fastpath connects the Macintosh's Localtalk with Ethernet.

Fastpath supports protocols including Decnet and TCP/IP and allows sharing of printers, file servers and other peripherals as well as electronic mail.

Novell took another step in its campaign to create a higher profile in Japan. Novell has formed a Tokyo-based joint venture with Softbank Corp., a software/peripheral distributor.

The new company, called Novell K. K., was registered for business March 30. Novell, the major partner in the venture, is joined by Softbank, Canon, Inc., Fujitsu Ltd., NEC Corp., Sony Corp. and Toshiba Corp.

The company will market and support Japanese versions of Novell's Netware product line. Novell K. K. expects to deliver its first product, Netware 386, this fall

"We're excited about this," said Tom Calabrese, assistant director in the telecommunications division at The Travelers Corp. insurance company in Hartford, Conn., which is planning to test the product. "We've been on the lookout for just such a system."

#### No nightmares

Hynes

Center

Boston,

MA

June

26-28,

1990

Convention

Calabrese said that The Travelers has so far avoided bringing its dial-up traffic onto its extensive T1 backbone network because of the "operational nightmare of the racks of modems and PADs" needed to do so.

Calabrese said, however, that the sys-

tem will not be successful if it "introduces any new problems to the already-trouble-some [error-prone] dial-up environment."

The vendor said cost savings will occur at reconfiguration and upgrading time when downloaded software can be used instead of discarding existing hardware. Cost of the system is \$31,500 for a configuration with one T1 interface, 24 V.22 bis modems, Primary View, cabinetry and power supply.

"If you can eliminate a number of black boxes, more power to you," said George Newman, manager of communications at Technology Investment Strategies in Framingham, Mass.

He added that companies starting to build networks and those replacing modem banks over time in their data centers would be the most likely candidates for the product. Other targeted customers are enhanced services providers and local and long-distance carriers.

Newman noted that the all-in-one approach has historically been a difficult sell for vendors in that "a specialized device may be fine-tuned for what you need, where the integrated product might be more generic."

The vendor said it sees an \$879 million market for the system, a sum of the market segments for the various devices it replaces. Primary Access began shipping last month.

#### PULL YOUR MIDRANGE

#### WORLD TOGETHER



Midronge World 90 pulls your world together with the latest multi-vendor integration products. Connectivity solutions for DEC, IBM, and Unix systems. It's the only interoperability event for your AS/400, 3X, VAX, H-P, Sun...all your midrange machines.

Midrange-dedicated seminors thoroughly examine orchitectures, interoperability strategies, client/server computing, commercial environments, enterprise networks, technology trends, OLTP. Also, systems performance, satisfaction and cost of ownership.

**BONUS: free admission to DEXPO East...** where you'll find 10,000 DEC computing and connectivity products and services. Travel freely between shows. Compare solutions from IBM and 300 more leading-edge vendors.

Coll for your Midrange World 90 preview, **free** V.I.P. show tickets, and Conference Program. Coll **800-873-3976** (8 30-5 30 EST)

MIDRANGE WORLD Show and Conference

Organized by Expoconsul International Inc. 3 Independence Way Princeton INJ 08540

DEC VAX are grademarks of Digital Equipment Corp. AS/400, 3x are trademarks of IBM. UNIX is a trademark of AT 5.7.

#### Hubble reaches out to terra firma

BY GARY H. ANTHES CW STAFF

GREENBELT, Md. - It was hard to tell if Paul Ondrus regretted scheduling an interview just two days after the launch of NASA's Hubble space telescope. But it was clear that the director of the missions operations support office at the Goddard Space Flight Center had other things on his mind.

The telescope's high-gain antenna would not lock onto the satellite needed to relay data to the ground, and Ondrus punctuated the meeting with anxious telephone calls and consultations with colleagues.

Nothing is simple about the \$1.5 billion Hubble telescope, now stretching its wings some 380 miles above Earth - certainly not data communications.

Volumes are high; a megabit of imagery data will flow from the telescope every second, 24 hours a day for at least 15 years. Readings that show the status of the telescope's many complex instruments are sent from each of 6,000 sensors once per second. Scheduling data, which tells

the telescope where and when to look, must flow virtually errorfree to the telescope through a tortuous terrestrial and celestial route.

Scheduling is almost unbelievably complex, Ondrus said. Each day, the telescope's instruments and controls act on 20,000 commands, which are relayed from Goddard. Timing is crucial in order to prevent the telescope from damaging itself and to avoid wasting precious viewing time. Scheduling algorithms use artificial intelligence and statistical techniques to balance hundreds of often conflicting factors.

Scientists wishing to conduct experiments must have their requests approved and in the schedule queue more than one year in advance, and space telescope glitches can require rerunning the scheduling programs for a period stretching back over three weeks.

"It's like an air traffic control system with a new flight schedule every day, and if one plane is late you have to reschedule all planes for three weeks," Ondrus said.

The schedules and other commands are relaved from Goddard to a NASA ground station in White Sands, N.M., via a domestic communications satellite. They are then relayed to one of two tracking and data-relay sat-



the telescope.

rection codes.

Data coming back follows the

same path in reverse. The tele-

scope may send data in real time,

or it may store it on tape if the re-

lay satellite is temporarily out of

view. Imagery data is sent in

4.8K-bit blocks that include ad-

dress information and error-cor-

The Hubble telescope relays data from 6,000 sensors every second

ellites hovering in geosynchronous orbits at altitudes of 22,000 miles. The relay satellites, operating in S-band and K-band frequencies, then relay the data to

After various data clean-up and validation steps, the imagery data is transmitted using Digital Equipment Corp.'s Decnet over leased telephone lines to the Space Telescope Science Institute in Baltimore, where it is further processed, calibrated and stored on tape and optical disc.

Data undergoes a sophisticaterror-correction process, called Reed-Solomon, that uses multiple check bits for coding and decoding. An error should occur no more than once in every 10 million bits, or 100 times better than offered by conventional techniques, Ondrus said.

In addition to imagery data, Hubble sends back more than 500 million instrument readings daily. An expert system evaluates the real-time readings, looking for and even predicting problems. Problems are displayed graphically on workstations, keyed to pictures of the telescope and its components.

The expert system suggests corrective measures, ground technicians respond by sending commands or parameter changes back to the telescope.

Ondrus's staff eventually discovered that a cable, slightly too long, had prevented the telescope's antenna from swiveling properly toward the relay satellite. A series of tricky computer commands went up, and everything worked — for the time being.

#### **Public nets**

FROM PAGE 59

tions market research firm in Haddonfield, N.J.

Cost efficiencies are easier to come by for large users in that "if you have a certain volume of traffic, the major carriers can all offer you a similar, attractive price," says Richard Bolenbaugh, a senior telecommunications analyst at The Los Angeles Times, which uses MCI Communications Corp.'s Vnet virtual network. "The real legacy of divestiture is service" - a high percentage of network uptime, clear transmission quality, quick resolution to network outages and keeping the user informed about network status, he says.

Nolle estimates that for companies with monthly telecommunications budgets under about \$4,000, switching carriers for cost savings is not worth the effort if service quality suffers. "Users need to achieve savings of 15% to 20% to justify giving up any quality," he says.

The economics associated with volume discounts and custom networks — bundles of network services tailored to a company's individual needs — have made public networking attractive. Carriers now see a positive return on investment from designing a package of 800, WATS, switched 56K, T1/fractional T1, Integrated Services Digital Network (ISDN) and other services for customers. AT&T, for example, offers corporate custom networks under Tariff 12 contracts.

The reliability of digital lines combined with the economics of switched solutions such as virtual private networks and ISDN are another lure to the public network. Switched access can be less expensive than leased lines, depending on traffic volume, in that customers only pay for bandwidth when they use it.

Virtual networks allow customers to allocate a portion of the public network between their premises and the carrier's central office to a mix of services and destinations. AT&T provides this service under its Software-Defined Network offering, U.S. Sprint Communications Co. under its Virtual Private Network and MCI under Vnet.

Money savers

Virtual networks attempt to offer the channel allocation flexibility of a private network without forcing users to make large capital investments in their own equipment or in dedicated lines. Virtual networks allow users to reallocate bandwidth as traffic fluctuates during the day.

Dynamic bandwidth allocation for voice is offered in real time over AT&T's and Sprint's ISDN Primary Rate Interface lines on a call-by-call service selection basis. This service is not vet available on the data side because it is not cost-efficient for carriers to run fiber to customerpremises equipment (CPE), Nolle says, adding that the gigabytes of bandwidth provided by fiber would be needed for bandwidthon-demand for such applications as video on a switched basis.

Synchronous Optical Network (Sonet), an emerging fiber transmission and interface standard that gives users access to individual chunks of fiber bandwidth, will be key in bringing fiber to CPE and reducing digital technology costs, Nolle says.

The rapid proliferation of fractional T1, which allows a user to lease 64K bit/sec. increments of a 1.5M bit/sec. T1 pipe, is also offering significant cost savings to those not needing full T1s. For example, per AT&T's November 1989 tariffs, a leased 64K bit/sec. increment from AT&T running from Washington, D.C., to San Francisco is \$1,026 per month, compared with a monthly charge of \$20,272 for a full T1.

With the new options available from carriers, some firms are focusing on business issues, not on being their own phone companies. Paine Webber, for one, is outsourcing much of its network operations to AT&T.

Largely because of their regulated status, local exchange carriers are two years behind the interexchange carriers in introducing enhanced services, says Steve A. Sazegari, an analyst at Dataquest, Inc. in San Jose, Calif. He says this motivates users and long-haul carriers functioning as systems integrators — to seek bypass alternatives.

It is possible for users to collocate equipment, such as private T1 multiplexers, in the interexchange carrier's central office and bypass the local carrier. Some firms with large fractional T1 networks are finding this cheaper than paying for the extra bandwidth of running full T1s from many dispersed sites to local central offices.

Joe Gallo, senior director of corporate telecommunications at Automated Data Processing, Inc., in Roseland, N.J., is collocating his T1 switches in Sprint's central office for his brokerage network. Gallo says he can reduce his access costs 50% by going straight to the interexchange central office.

The ability to reconfigure a network in real time, usage monitoring and automatic call routing were among highly rated network features in a recent survey

by Frost & Sullivan, Inc., a market research firm in New York.

MCI and AT&T have announced network management interfaces that allow users to key in a circuit number at a terminal and find out that a T1 line is down, locate an associated equipment failure and determine an expected "fix" time.

In addition, services such as AT&T's Customer Controlled Reconfiguration allow users to lease a portion of a central office digital cross-connect — which switches T1 lines in increments of 64K bit/sec. — and make changes to network configuration as if they had private nodes.

#### Contract counsel

One way for users to ensure that vendors provide them with what they need is to nail down a service contract. Users and analysts offered the following advice:

• Define procedures for escalation — the amount of time allowed for repairs at each level of expertise before passing the project up to the next highest level — and define essential circuits for priority maintenance.

• Specify diverse routing, uptime guarantees and quality of service.

• Know what equipment you will use and how it will mesh. "Get all your vendors and carriers together and draw up a schematic from one end of the network to another," advises June Hoffman, telecommunications supervisor at Kaiser Permanente, a health maintenance organization. Hoffman also says to negotiate price for T1 lines.

• Insist on a "favored nation" clause in your contract, which ensures that if the carrier offers a similar service to someone else for a lower price, you automatically get that price, advises Bill Rahe, president of the Aries Group-MPSG, a market research firm in Rockville, Md.

JOANIE M. WEXLER

#### Fritz

**CONTINUED FROM PAGE 59** 

transfer the data, drop the call and connect to the next destination. Users can automate the process through the use of the script languages supplied with modern communications programs. However, writing and debugging scripts can be tricky for the casual user.

Fortunately, software vendors have provided ways of automating the process by integrating their software into ISDN's fabric. Easystreet, from Newbridge Networks, Inc. in Herndon, Va., and Manylink, from Manylink Corp. in Redmond, Wash., are specifically designed to support ISDN virtual networking. The software transparently handles device destination lookup, call setup, data transfer and call termination.

This gives users the impression that ISDN is a virtual local-area network able to connect to many destinations over great distances. Ken Wade, president of Manylink, said, "[Virtual LAN software] allows standard applications such as Wordperfect or Lotus' 1-2-3 to access devices on the ISDN network."

Once connected to ISDN, the software can use devices such as remote printers that are located far outside the normal range of LANs. In fact, the term LAN is actually a misnomer because the virtual network range is far enough to be considered a metropolitan-area network. According to Wade, "The goal [in developing virtual LAN software] was to implement shared data conferencing in a method similar to voice conferencing. For example, a joint editing project can be done on-line with existing software, allowing several users to work on a common spreadsheet."

Easystreet and Manylink are solid packages that are well-thought-out and highly integrated into an ISDN environment, although each has its advantages in comparison with the other. ISDN virtual LAN technology makes it possible for a home worker or remote user to access files from office computers. No coaxial or special cable needs to be run because ISDN uses the telephone company's standard wiring.

One drawback of ISDN virtual LANs is that file transfers are slower than those in most conventional LANs. Since virtual LAN packages typically use ISDN's D channel at 9.6K bit/sec. or B channel at 19.2K bit/sec., this is to be expected. One way around the problem is to use faster terminal adapters supporting asynchronous communications at 38.4K bit/sec.

Even if files don't get transmitted at full LAN speeds, some virtual LAN software packages can move the process into background mode, so the computer can do other applications while the file transfer is under way.

Is it overly optimistic to think that ISDN virtual LAN technology can become a major ISDN application? Probably not. Cost and a lack of unique applications are two of the biggest obstacles to widespread ISDN use. Clearly, virtual LAN connectivity offers users a unique application not readily supported by other data communications technology. Given its potential, ISDN virtual LAN technology may indeed play a major role in putting ISDN services on the map.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

NEW DEALS

#### U.S. Sprint awarded weather system pact

The U.S. Department of Defense has awarded U.S. Sprint Communications Co. a five-year, \$10 million contract to serve as systems integrator for the department's Automated Weather Distribution System program. Sprint said it will provide high-speed network services and equipment for providing real-time weather information and graphics to U.S. Air Force bases throughout the continental U.S. The carrier will also provide field maintenance and network operations staff for the program.

The Bank of Bermuda has licensed Systems Strategies, Inc.'s Ezbridge File Transfer/Mail software in order to permit financial reports to be electronically transferred be-

tween the bank's IBM System/38 and Digital Equipment Corp. VAX computers. It will also be used to deliver reports to customers who use the bank's accounting services to keep track of their funds, Systems Strategies said.

The Franklin Institute science museum in Philadelphia will be working with Unisys Corp. to design and implement an interactive information system for visitors. Called Unisystem, the system will consist of computer stations in various exhibit areas that will answer visitors' questions when a barcoded card is inserted. The system is scheduled to become operational in the museum's new Futures Center this month and in the Science Center in December.



How to tell for sure if your data center has been moved.

If a 3270 terminal gave you fast response times, you'd assume that an IBM mainframe computer was nearby.

But it could be miles away, if the terminal was attached to RDS<sup>™</sup>-the Remote Device System from Network Systems.

RDS extends IBM channels to anywhere fiber or phone lines will go, with no performance loss. Terminals, high-speed printers, even cartridge tape drives run just fine under RDS, without a local (and expensive) IBM mainframe nearby.

In fact, when agricultural co-ops Land O'Lakes and Cenex merged their corporate staffs, RDS helped eliminate an extra data center. Users couldn't tell it was gone.

Call us at 1-800-338-0122 for more about RDS-channel extension that makes remote sites perform like they're right across the hall.

Network Systems.

©1990 Network Systems Corporation.

## SMOKE



#### IBM's RISC System/6000.

**No** graphics workstation under \$12,900

**No** complete family available until end of 1990

**No** system over 41.1 Dhrystones MIPS

**No** commercial 4GL/DB software available across full line

**No** symmetric multiprocessing

No OSI support

**No** industry-standard RISC chip

**No** multivendor binary compatibility

No 19" color workstation under \$16,300

No VME support

No commitment to system V.4 support

**No** broad performance range

AViiON is a trademark of Data General Corp. RISC System/6000 is a trademark of International Business Machines Corporation, UNIX is a registered trademark of AT&T. The above comparative product data is based on IBM price lists, onnouncement material, and other published material available as of March 27, 1990. All prices are manufacturer list prices for single unit purchases. @1990 Data General Corporation.

## VS. FILE

SYMMETRIC MULTIPROCESSING \

4.DetaGeneral

**MULTIVENDOR BINARY** 

**INDUSTRY-STANDARD** 

**INDUSTRY-STANDARD** 

**4GL/DB PRODUCTS** 

**MOTOROLA 88000 CHIP** 

**9 LEADING COMMERCIAL** 

COMPATIBILITY

**VME SUPPORT** 

EXTENSIVE FAMILY AVAILABLE TODAY

EXTENSIVE COMMERCIAL SOFTWARE AVAILABLE TODAY

GRAPHICS WORKSTATION UNDER \$7,500

COLOR WORKSTATIONS UNDER \$12,000

STABLE, PROVEN HARDWARE/
SOFTWARE SYSTEMS

SYSTEM V.4 COMPATIBLE



17-50 MIPS - PERFORMANCE RANGE

Data General's AViiON /Family.

#### Call 1-800-DATAGEN to learn how Data General's AViiON compares to IBM's RISC System/6000.

If lots of hype decides who has the best UNIX® system-based RISC computer, then IBM wins. But if benefits like real openness, real software, real speed, real economy, and real service have any impact, then AViiON™ is still on top. Best of all, the AViiON/Family is a proven system you can install today. In fact, if you call today, you can get details on how you may qualify for a free AViiON workstation.

While IBM touts their proprietary RISC chip, AViiON offers the industry-standard

Motorola 88000 chip. Combine this with our open AViiON operating system, hundreds of immediately-available software applications, and an industry-standard VME bus and you can begin to see an openness not embraced by IBM.

So the choice is clear, IBM's RISC System/6000™ or Data General's AViiON/Family. For complete details on how IBM's smoke compares to our fire, call 1-800-DATAGEN.

Name \_\_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_\_ Phone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_ Zip Code \_\_\_\_\_\_

Data General
3400 Computer Drive, Westboro, MA 01580

Free AViiON workstation for qualified system buyers. Call for details.

#### Internet makes users KIS-ing cousins

Prototype retrieval system bridges disparate network directories

BY GARY H. ANTHES CW STAFF

RESTON, Va. — A prototype system has been put in place that can transparently search Internet directories, retrieving electronic mail addresses and other information for users trying to locate other users.

Imagine a city with one million people and dozens of neighborhoods, each with its own telephone directory in a unique format. Now imagine you want to call a friend in this city, but you don't know the telephone number or address.

This sounds like a challenge, but it is the prospect that confronts users of Internet, the conglomeration of networks that links some 200,000 computer hosts and one million users. The 2,000 international, national, regional and local networks that make up Internet evolved more or less independently and are loosely coupled through gateways. There is no central directory, or so-called white pages service, to help users reach out and touch one another.

Some groups of Internet Email users — those on Milnet and Csnet, for example — are supported by directories, but thousands more are not listed in any readily accessible database. Querying the major directories is tricky, since each demands a different kind of query and returns information in a different format.

The new umbrella service, called the Knowbot Information

Service (KIS), is being developed by the Corporation for National Research Initiatives (NRI), a nonprofit firm that specializes in data communications.

NRI coined the term Knowbot to refer to programs that

can access network resources on behalf of their users. Knowbots visit multiple network sites and bring back useful information while remaining the agents of their respective users.

A KIS user enters the last name of the person sought. A Knowbot searches each of the major Internet directories, then returns the full names of all users with that last name. KIS also identifies each person's source, the E-mail address, telephone number, mailing address, date of last update and possibly other information. The display format is consistent, regardless of the source. KIS users can limit the information returned and the places searched by qualifying their queries in various ways.

"KIS is having someone willing to sit at your desk and thumb

through a whole bunch of telephone books," said Marshall Rose, principal scientist at Reston, Va.-based Performance Systems International, Inc. Rose heads a pilot project to evaluate the feasibility of the

CCITT X.500 standard for directory services for use on Internet

At present, KIS searches seven major Internet directories. The oldest is at the Network Information Center at SRI International that holds more than 50,000 user entries, most for Milnet users. The largest, with more than 110,000 mailbox addresses, is part of MCI Communications Corp.'s E-mail service. About 400,000 users are now

available to KIS, and more white pages services will be added, said Vinton Cerf, a vice-president at NRI.

By default, KIS will not look at the local "finger" services of University of California at Berkeley Unix Version 4.3 systems because there are far too many of them, but a KIS user can specify one or more of these local user-account databases to be queried.

KIS is accessed through a local client Knowbot that is run as a user program. The client Knowbot communicates with a server Knowbot through a Transmission Control Protocol/Internet Protocol port. The server Knowbot fields incoming queries and issues requests to the remote directory services. The responses are formatted by the server Knowbot and returned to the client Knowbot.

KIS can be used interactively by those who have Internet accounts or via E-mail by those who do not. Mixed modes allow a user to make a query interactively, with the results returned by E-mail.

KIS is operational, but it is likely to have bugs and be somewhat cumbersome to use, Cerf said. The user interface Knowbot now uses is a crude "dumb terminal" display, but NRI plans to add an X Window System interface with user-friendly menus of options, he said.

X.500 is an approved standard, but it will be years before it is in widespread use on the Internet, Rose said. He said Performance Systems' goal is to have interactive, distributed X.500 service covering 90% of Internet users in place within seven

Even with X.500 implementation, KIS will still be useful because its Knowbots can be trained to accept X.500 queries, access non-X.500 databases and return results in X.500 format, Cerf said.

In any case, neither KIS nor X.500 will solve the biggest problem facing directory services — how to keep them complete and correct. Fewer than half of Internet users are listed in a directory, and many entries are hopelessly out of date, Cerf said.

#### Sun announces ship dates for set of ONC enhancements

BY ELISABETH HORWITT CW STAFF

MOUNTAIN VIEW, Calif. — Two weeks before the Open Software Foundation is expected to choose the Decorum system as its official distributed computing standard, Sun Microsystems, Inc. announced a two-year strategy for making its own rival platform, Open Network Computing (ONC), the "true" standard.

Sun announced year-end shipments for previously announced ONC enhancements that are designed to extend the platform's networking support beyond Transmission Control Protocol/Internet Protocol.

First, ONC will support the Transport Layer Interface component of AT&T Unix System V Release 3, which is said to allow applications to communicate transparently across a variety of networking protocols including, in the future, Open Systems Interconnect.

Second, ONC will support Netwise, Inc.'s remote procedure call compiler, RPC Tool, which is said to facilitate the porting of distributed applications across various network and computer operating systems. Novell, Inc., 3Com Corp. and Banyan, Inc. have all said that they will support ONC on their networking systems via Netwise's compiler.

Sun also said it plans to enhance its Network File System (NFS). In the performance area, the vendor introduced an asyn-

chronous version of the NFS that is said to eliminate the need for a system to suspend all tasks while it waits for the completion of the task it has initiated on another system. The enhancement will ship by year's end, according

The company said that it will incorporate utilities for "streamlining NFS requests" as well as local disk caching to reduce network traffic.

Sun announced that by the first half of next year, NFS will support Kerberos, a security system developed by MIT's Project Athena. NFS will continue to support Sun's Secure product, the vendor said.

#### Object orientation

In addition, Sun said it will enhance its naming services to be object-oriented "so that users can browse through network resources" asking, for example, for a "class of information such as 'Tell me about all corporate network gateways," said Geoffrey Baehr, the company's vice-president of distributed systems.

Sun announced that it will also provide a gateway that will allow its naming services to interoperate with systems that support CCITT X.500, although the vendor has announced no plans to actually migrate its naming services to the directory standard.

Neither of the above announcements will be released until "1992 and beyond," Sun said.

#### NEW PRODUCTS

#### Local-area networking software

Phaser Systems has announced support for the IBM ES/9370 Models 10, 12 and 14 computer system with Netware for VM, the company's version of Novell, Inc.'s local-area network operating system.

Netware for VM for the ES/9370 allows personal computer/LAN users to establish Netware disk volumes on mainframes, transfer data and applications between Netware LANs and IBM mainframes and link to other remote LAN systems via a Systems Network Architecture internetwork bridge, the vendor said. A version of Netware for VM that uses the Token-Ring communications adapter of the ES/9370 is available now.

Pricing ranges from \$20,000 to \$75,000, depending on type of mainframe used.

Phaser Systems
Suite 650
One Market Plaza
Spear St. Tower
San Francisco, Calif. 94105
415-495-6300

#### Customerpremises equipment

Gandalf Data, Inc.'s TA-1 Basic

Rate Interface terminal adapter allows network managers to use existing equipment to access Integrated Services Digital Network (ISDN) facilities.

The product facilitates multiplexer, front-end processor, cluster controller and local-area network bridge and gateway transport applications by allowing them to run over high-bandwidth ISDN facilities. The adapter converts data to and from ISDN-compatible streams and accepts synchronous data at up to 56K bit/sec. or 64K bit/sec.

The product costs \$1,095. Gandalf Data 1020 S. Noel Ave. Wheeling, Ill. 60090 708-459-9348

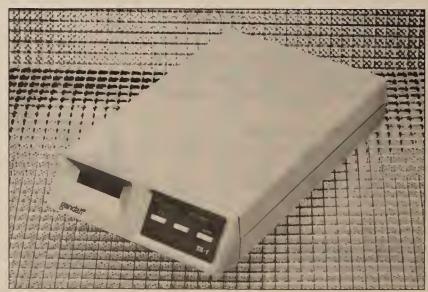
#### Protocol converters

General Datacomm, Inc. has introduced a miniature converter designed to provide the interface between asynchronous terminals and synchronous data communications devices.

The GDC ASC-3 can convert at speeds up to 19.2K bit/sec. It operates in point-to-point or multipoint network applications, and users can choose asynchronous data rates from 600M bytes to 19.2K bytes.

The product is scheduled to be available next month for \$245.

GDC Route 63 Middlebury, Conn. 06762 203-574-1118



Gandalf Data's Basic Rate Interface terminal adapter allows applications to run over high-bandwidth ISDN facilities

# Technically, It's An Architecture.

But It's Really Something Else.

## Freedom.

Freedom to choose.

0

M

Freedom to change.

Freedom to grow.

U

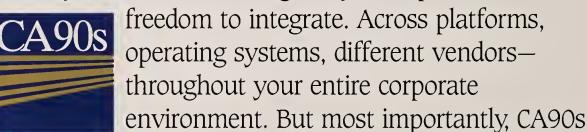
The basic tenets underlying the most advanced, and independent architecture ever developed.

CA90s from Computer Associates.

Since it comes from the world's leading, independent software company, CA90s can liberate you from hardware constraints.

At last, you're free to choose the best applications and deliver more efficient distributed processing.

Since it encompasses SAA, NAS and the other industry standards, CA90s gives you unprecedented



gives you the freedom to grow. It continually protects your MIS investment by always providing ways to integrate new technology with your existing technology.

Altogether, CA90s is the architecture that offers you the freedom to face tomorrow.

And it's ready just when you need it the most. Today.

N

G

T

## Today.

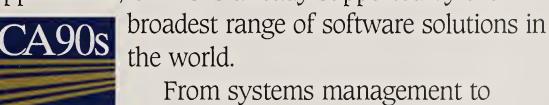
Not next year.

Next month.

Next week.

CA90s is here today.

Unlike other architectures that patiently await applications, CA90s is already supported by the



information management to business
there are literally hundreds of application

applications, there are literally hundreds of applications that deliver the benefits of CA90s.

But that's only the beginning.

E

T

The real magic is in how these applications work together.

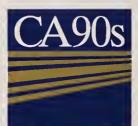
By sharing common services and advanced technology, CA software brings you the highest levels of integration and automation in the world.

Starting today, in every aspect, CA90s will change the way you look at your MIS world.

C

# And Tomorrow.

The world of high technology moves very fast.



And around every bend is a fork in the road. Right or left. Yes or no. It seems your options are always limited. And if you make the wrong choice, you could be left behind.

But, it doesn't have to be that way.

CA90s can change your entire approach to future technological breakthroughs. It's designed specifically to accommodate rapid change while at the same time protecting your investment. So you can have the best of both worlds.

It accomplishes this in two ways.

The first is forward-looking. CA90s shared-services approach gives you the freedom to change because new technology can be quickly and easily implemented and integrated.

Looking backward is just as important. Recognizing the enormous investment you've made in your existing technology, CA90s always provides responsible, efficient ways to migrate to new technology. The net result is you can approach the future with confidence.

No matter what you face, you'll always be free to make the right decision.

9

Free to grow.

H

- 10

Free to choose your own road.

E



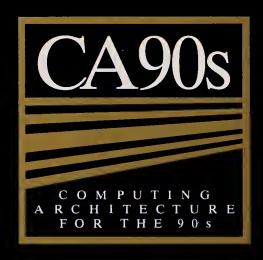
0

S











Computer Associates International, Inc., 711 Stewart Avenue, Garden City, New York 11530-4787 1-800-645-3003

#### MANAGER'S JOURNAL



Ewing L. Lusk has been promoted to scientific director of the Advanced Comput-

ing Research Facility (ACRF) at the U.S. Department of Energy's Argonne National Laboratory in Argonne, Ill.

Lusk was previously deputy scientific director of the ACRF. Before joining Argonne in 1982, he was a professor of computer science at Northern Illinois University. He holds a bachelor's degree in mathematics from Notre Dame University and a Ph.D. in mathematics from the University of Maryland.

James W. Rackley has been named president and chief executive officer of Trident Infotech (USA), Inc., the newly formed data processing subsidiary of Neptune Orient Lines in Oakland, Calif.

Trident Infotech is responsible for information systems and communications services for Neptune and its North American agent, Tricom Shipping Agencies, Inc. Trident Infotech also offers outside customer services, including transportation software, software development and outsourcing.

Rackley was most recently general manager of Trident Infotech PTE Ltd. in Singapore. He also spent five years in senior IS management positions at Neptune in Singapore. His 10 years in IS management prior to that included jobs at Sea Land Services, Energy Transportation Corp. and Delta Steamship Lines.

#### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and Computerworld wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, Computerworld, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

#### Taking the 'place' out of workplace

Telecommuting technology is expanding out-of-office work, and IS is at the forefront

BY J. A. SAVAGE CW STAFF

n the volatile management issue of telecommuting, information systems managers appear to be far ahead of their peers in other departments.

During the last few years, the technology infrastructure has grown to accommodate work done from places other than the office. While IS employees are rarely discouraged from coming into a central office, the change in infrastructure is allowing managers to get productive work from them even when they are not in the office.

'The work that people do in IS lends itself to telecommuting," said Paul Blake, staff manager for Pacific Bell's customer IS in San Ramon, Calif. "If you're a programmer or a maintenance type, you're sitting by yourself with your tube and your manuals. The biggest problem is interruptions, and when you're telecommuting, you don't have those interruptions."

With computer rooms in 24-hour operation, it is not unusual to have companies provide each IS staffer with a home computer for remote diagnostics, as does Ask Computer Systems, Inc. in Mountain View, Calif. Beepers are also an integral technology that allows employees to work remotely, yet always be in touch.

The definition of telecommuting is gaining breadth to include the use of beepers and other products, according to Paul Saffo, a research fellow at the Institute for the Future, a Menlo Park, Calif., think tank. It was formerly un-



derstood to simply mean a way for an employee to work at home using a personal computer.

Saffo said that in the 1990s, the creeping technical infrastructure, such as facsimile machines in hotels, phones on airplanes, cellular phones, electronic mail and voice mail, will allow work to be done in places other than the office. American Airlines, for example, recently announced an "office in the air" on international flights (see story page 69). This would still be considered telecommuting, even though work is not necessarily being done at home. Software applications, such as groupware, which allow employees to work separately on the same project, and small, powerful computers to run such software are also becoming a more common means of telecommut-

Saffo said that taking advantage of these products will give companies more flexibility and a cost advantage. One such advantage would be locating a company or a department in a nonmetropolitan area where the cost of doing business is cheaper.

For instance, a software development center could be in Boise, Idaho, Continued on page 69

#### Shore leave for better systems design

BY JIM NASH CW STAFF

n two Chevron Corp. subsidiaries, users of information systems projects: face-toface discussion.

The San Franciscobased petroleum giant has deep-sixed several corporate policies, said Bardin Nelson, senior systems analyst at Chevron Information Technology (CITC), for the sake of a pilot project that brings pro-

grammers and users — including tanker crews — together in close quarters.

"We are attempting to make information sharing as painless and efficient as possible through a coordinated group effort," Nelson explained. CITC and Chevron Shipping Co. are developing standardized shoreside and ship-

board software and a worldwide network linking Chevron with its approximately 40 tankers.

In 1989, Nelson and his 10-person team moved from their CITC offices in services have a new tool for San Ramon, Calif., to the San Francisworking with programmers on co high rise that also houses Chevron

> Shipping. Chevron also began rotating two fleet officers at a time to duty on the project. He said the group will stay indefinitely to develop and refine the resulting software and hardware.

> "Our group exclusively supports Chevron Shipping," Nelson said. "Nor-

mally, [CITC] groups are project-oriented. Here, we've bundled together [shoreside and shipboard] applications development, which is a departure from our insulated approach in the past."

Chevron Shipping's Geoff Landon said that the approach has been well received. This way, he said, they have much more control over project direction and ingredients. Landon said particular attention has been paid to fleet officers, who put in five months — the length of an average voyage — working with Nelson's team.

"Our officers are the single most untapped source of productivity and quality improvement at Chevron," Landon said. "We fit the needs of the ship first and secondarily the needs of the home office.'

Officers are picked for the project, Landon said, based on their professional expertise and ability to clearly see what Chevron wants to accomplish with the project.

Despite not targeting technophiles, there has been little resistance on the part of officers.

"The officers do it all while they are here, from needs-listing to flow-charting," Nelson said. "They go back to their regular duties as disciples and preach where we can't reach."

#### People: Toughest part of partnerships

BY ALAN J. RYAN CW STAFF

TORONTO — Marrying technology to the business was a hot topic in the late 1980s. Now, as companies move into the 1990s, the partners formed by that bond will be finding themselves held accountable for their company's bottom line.

So said speakers at the recent "Partnership Conference," sponsored by LOMA, an international association for the insurance and financial services industry.

"Business is not separable from tech-

nology any more," said Mike Tine, senior vice-president in the financial services department at The Travelers Corp. in Hartford, Conn.

Larry Bacon, senior vice-president of The Travelers' information systems department, agreed. For 20 years, Bacon said, technology was

applied to the business when the business people requested it. "Neither group understood each other," and the process of building systems could take up to two years, he said. When systems were created, they often simply automated a formerly paper-based function, he said.

However, increased competition, the

tremendous costs associated with long systems development and the changing markets of the insurance industry have brought about changes, Bacon said. Foremost are

the partnerships between the businesses within The Travelers and the systems department

"The partnership brings product design and systems people together at the

beginning" of a project, Bacon said, and systems workers "are aligned to that line of business every step of the way." The partners are driven by business results rather than by business or technical considerations alone, he said.

The partnership can only work if there is a clear vision and capable people behind it, Tine said. "The technology is the easy part here."

When The Travelers' financial services department was looking at ways to improve its success in the annuity market, a task force of the best workers in that area and in the systems area was handpicked by Tine and Bacon and asked what could be done. The group formed service principles: quality, error-free processing that would provide good customer service and have easy access for customers.

The people conducting the study did not talk about the technology; they simply came up with a fix to a problem and then worked with the systems people to find the most effective system to meet that need, Tine said.

Working together, the team came up with the idea of having a skilled customer service representative who could be reached by customers via a toll-free phone number, facsimile or mail, Bacon said. The representatives would have all the information a client might request at their fingertips. "The service rep can take care of new business, billing and collecting, research and support, customer reporting and shareholder accounting," among other things, Bacon said.

The project was highly involved and expensive, but Tine said he believes the money was well-spent. It involved "several dozen people and cost several millions of dollars," he said. The project as it was originally planned would have taken up to two years to complete. "We didn't have the time," Tine said.

The decision was made to implement 70% to 80% of the functionality quickly. The other 20% to 30% may never be completed, or it may be modified pending the outcome of the initial phase, Tine and Bacon said.

**Looking for CLUES** 

A similar partnership at The Mutual Life Insurance Co. of New York (MONY) helped form CLUES, its Comprehensive Life Underwriting Expert System, which has been integrated with the company's administrative new business processing systems.

CLUES applies 800 rules to applications for life insurance and then goes through 7,000 steps to determine if the case should be accepted, rejected or if an underwriter should check it to add more information, according to William Daly, retired vice-president of selection who now does consulting at MONY.

The CLUES partnership began with one person in the company's corporate IS area looking at expert systems in 1985 and the subsequent discovery that the underwriting department was doing its own expert systems research. In 1986, the two areas began working together as a team, according to Arthur Szu-tu, assistant vice-president of corporate IS.

In its first month of operation, CLUES processed 285 cases and had a 7% approval rate. By June 1987, the approval rate had climbed to 15%. Currently, the system has a 33% automatic approval rate of all cases, and it handles 75% of all new underwritten business, according to Szu-tu

#### If you think a fault-tolerant network will be too expensive,

### think about what downtime costs.



The average Fortune 1000 company faces millions of dollars a year in lost productivity due to network failure.

Which is why so many companies are spending so much on their network management systems to reduce downtime.

But at Chipcom, we think that's the wrong approach.

We think that instead of reducing downtime, the real answer is to eliminate it.

Chipcom facility networks are designed to survive multiple failures, including broken cables, hardware problems, and human error with no downtime.

That's right. No downtime. No disruptions. Not to your users, or your customers.

Chipcom is committed to making facility networks as reliable as your phone or electric service. And we have the technology to make it affordable to companies like yours. In fact, we can show you how a Chipcom fault-tolerant network will pay for itself many times over. And give you something priceless in the bargain: Peace of mind.

For more information, call 1-800-228-9930.



#### **Telecommuting**

**CONTINUED FROM PAGE 67** 

where the cost of living is a fraction of that in major metropolitan centers. As long as there are good telecommunications links to headquarters, development could be done remotely.

These telecommunications links, which allow remote work, are another part of the infrastructure that has been in place only since the late 1980s. Idaho, for instance, had party lines that precluded the use of advanced telecommunications in "virtually every exchange in the state" until 1987, according to Perry Swisher, an Idaho public utilities commissioner.

Swisher claimed that the support of telecommunications has allowed businesses to locate in Idaho's small towns, where employees are able to enjoy skiing and the state's white-water rivers.

In the late 1980s, the advent of voice mail and E-mail made remote work more efficient. Both allow more detailed communications without the presence of both parties, and neither depends on the locale of the office or the employee.

"Voice mail and E-mail have really begun to lay the groundwork," said Gil Gordon of Gil Gordon Associates in Monmouth Junction, N.J.

Gordon, who has been preaching telecommuting for years, said he thinks software and changing organizational structures will be a boon for telecommuting.

Now, Gordon said, employees are relying on voice mail and E-mail even when they are in the same building. It makes little difference where employees are physically located.

The major stumbling block to telecommuting in the non-IS part of companies tends to be managers. Management is reluctant — to put it mildly — to have employees who cannot be observed, according to Saffo and Gordon.

IS managers, however, are more accustomed to the round-the-clock demands of systems and, as such, are obliged to allow employees to work sometimes without supervision.

"Managers need to get out of the mind-set that people are working because they can see them," Blake said. He did suggest, however, that managers have to be more organized to allow for a remote staff.

"You have to get all the administrative chores, like forms to fill out and meetings, all on the day that employee is in the office, rather than when [the manager] runs across or remembers the task," he said.

All the proponents of telecommuting agreed that managers have one more important task to make telecommuting work: They must devise their own methods to measure productivity other than in office hours.

In the larger scheme, Saffo said he thinks that all the technology in the world won't make corporations embrace telecommuting. "Technology enables, not drives," he said.

"We spent the last 40 years getting workers to their jobs. Now we have to think how to get jobs to workers. The change takes longer than expected," he said. He noted that personal computers have only been around for 10 years while

#### Coffee, tea or fax?

elecommuting from airplanes will soon be possible on American Airlines international flights. The company will offer not only those expensive — but convenient — in-flight phones but also facsimile machine service.

Those products, coupled with a portable computer, are about all it takes for telecommuting eight miles high, although the stewards and stewardesses have yet to take dictation. The airline has not set a date to introduce air fax, but it expects to have a plan within the next few months, according to a spokesman.

"Office in the air" capability will first be available on the "International Flagship Service," announced late last month. In its first iteration, the fax machine will be absent, but business-class travelers will have videocassette recorders.

"We don't know to what extent we will offer this to economy seats," the spokesman said.

the basic concepts of society — such as going to work in an office — have been around much longer.

Saffo said he still expects telecommuting to take off: "The surprise will come when companies realize they have the infrastructure together and all they have to do is add software."

#### Loss of the personal touch

hose who telecommute swear that their productivity increases. Jay Fenton, a principal engineer at Farallon Computing, Inc., in Emeryville, Calif., said his productivity increased

"drastically" after he began coming into the office only once per week instead of every other day.

Fenton, whose two home computers, fax machine and modem are supplied by Farallon, is high up enough in management that he is allowed to measure his own productivity. But his position is about to put him in the same boat with managers who want to see their employees.

"I'm just about to hire people to work for me," he said, adding that in his last job, he and his boss videoconferenced to communicate. "We started with a certain rapport, but the personalities turned into raggedy electronic images" and the working relationship

fell apart, he said.

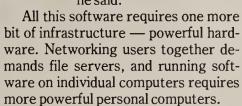
Fenton is about to hire someone who will come to his house for meetings. "I'm not convinced if you have to

supervise people you can do it just by talking [remotely]," he said.

Fenton is also a moderate user of groupware. Instead of electronic mail, which handles one-to-one communications, groupware handles group-to-

group communications. Groupware for programming projects, however, is more tricky than that for text and graphics.

Fenton suggested that programmers be face-to-face when finishing a program. "If you have to get together to change part of the program, you have to gesticulate a lot in order to reconcile the differences," he said.



Fenton said another needed technology is Integrated Services Digital Network cabling into houses. The current transmission rate, 9.6K bit/sec., is not productive enough, he said.

J.A. SAVAGE

#### OfficeVision/MVS

**Jay Fenton** 

TBS Software's office systems administration products help you get the most from IBM's OfficeVision/MVS and DISOSS offerings.

Personal Services Document Storage Reporter (CDSR) and DISOSS Document Storage Reporter (DDSR) provide information about every document filed in the OfficeVision/MVS Personal Services (or PS/CICS) document pool and the DISOSS library.

Personal Services Library Administration System (CLASY™) controls OfficeVision/MVS Personal Services (or PS/CICS) document pool growth by migrating inactive documents to an archive.

**DISOSS Online HUP Management (HUPDATE)** defines OfficeVision users in the DISOSS Host User Profile (HUP) data set.

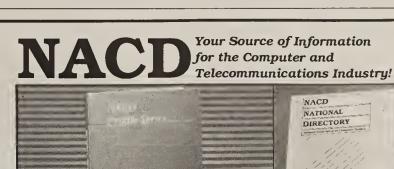
**DISOSS Online Routing Table Management (RUPDATE)** defines OfficeVision network nodes in the DISOSS Routing data set.



Free 30-day Trial ☎ (416) 940-9373
TBS Software Inc., 200-C Konrad Crescent,
Markham, Ontario, Canada L3R 8T9
Enhancing Your Office Vision™



Enhancing Your OfficeVision and CLASY are trademarks of TBS Software Inc. iBM is a registered trademark of international Business Machines Corp.



he National Association of Computer Dealers provides sources of information —The Profile Series, NACD's official National Directory and the Computer Blue Book. The NACD Profile Series features company profiles of 15,000 industry leaders printed in a twelve volume set of hard-bound books. Focusing on Manufacturers, Distributors, Service Companies and Secondary Dealers, this massive display of information is "the source" for the computer and telecommunications industries. Directories start at \$99.95. The National Directory is the industry's "Yellow Pages." Whether you need to find a source for products in Asia or just need the FAX or toll-free number for a current client, you will find it in the National Directory "Yellow Pages" — \$49.95. The Computer Blue Book is a Computer Price Guide showing suggested list, wholesale and used value for 20,000 hardware and software products — \$15.95. Call today to order your NACD Directories.

13103 FM 1960 West #206 Houston, Texas 77065

800-223-5264 U 713-894-1983 IN NACD National Association of Computer Dealers

69

#### AND THE WALLS CAME TUMBLIN' DOWN.

These days the walls are coming down all over. We're moving toward a more open world. And so is business. That's why your hardware and software solutions have to be more flexible than ever.

Unisys can help. We have systems that are designed to fit almost any operating environment. You'll get optimal applications that eliminate old computing barriers.

We're dedicated to opening the computer environment and doing what it takes to give you the freedom you need to compete today.

Our mainframes can give you the application portability, integration and compatibility you need by meeting computing standards like POSIX,OSI,TCP/IP and by connecting with SNA.

And when it comes to UNIX® technology, no one can match our product breadth and software depth from micro to mainframe.

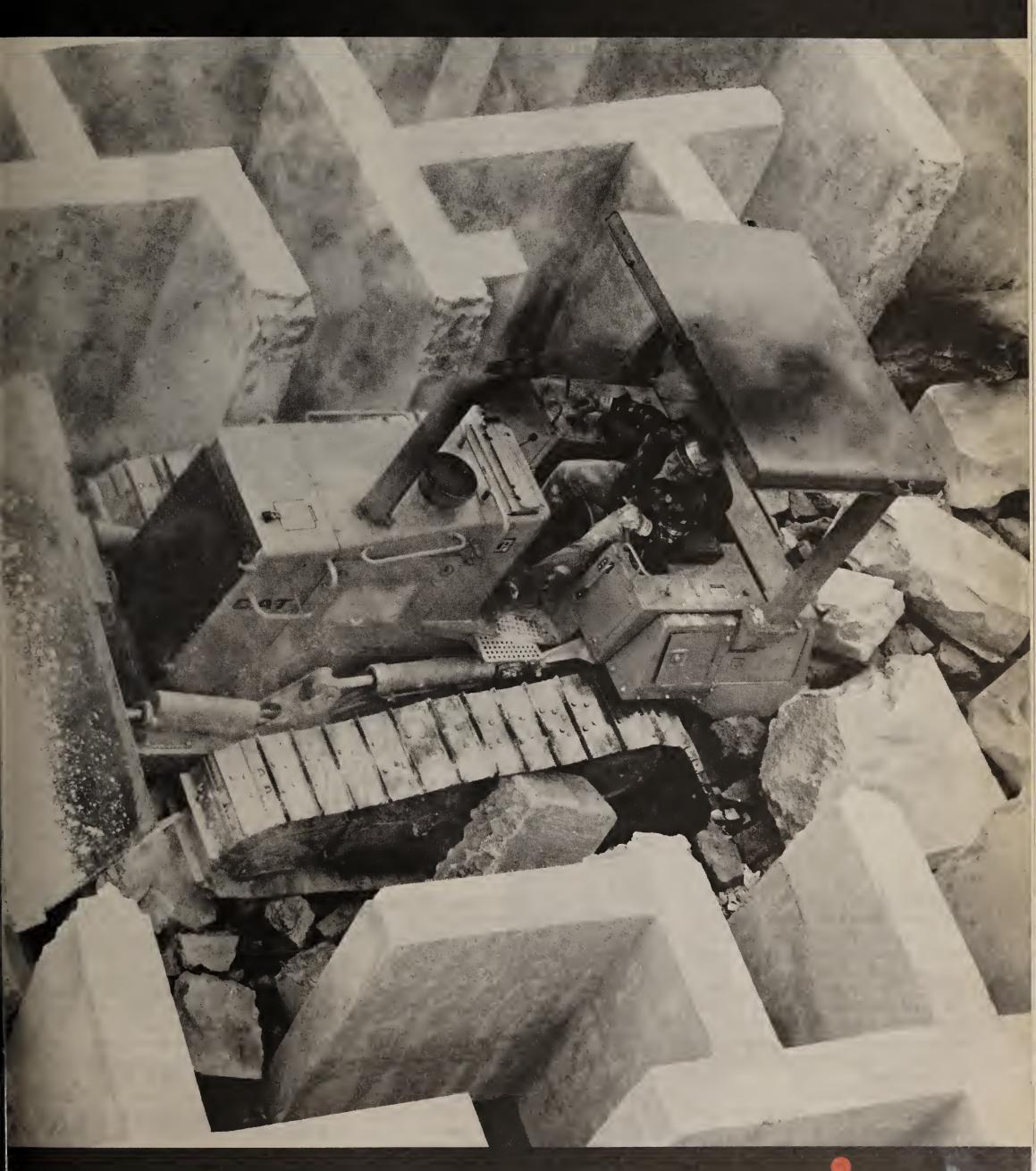
We'll be offering you UNIX On Line Transaction Processing (OLTP) as well. It matches the sophistication and speed of commercial on-line transaction processing with the complete flexibility of open systems.

We'll assist you in determining what systems you need, help you design, customize and install them. And we'll do whatever has to be done to keep it working efficiently and profitably.

Just call us at 1-800-448-1424, ext. 31. We'd like to knock down some walls for you.



© 1990 Unisys Corporation.
UNIX is a registered trademark of AT&T.



UNISYS WE MAKE IT HAPPEN



### Which computer is the most powerful?

Okay, so it's a trick question. But the right answer could be worth millions to you and your organization.

The average computer company would have you believe that you can measure power purely in machine terms. Like megahertz or MIPS.

But how many megahertz does it take to get twice as much work out of half as many people? Or get a roomful of sophomores excited about economics? Or let a harried executive quickly transform half-a-million spreadsheet cells into a presentation that will bring 500 sales reps to their feet in wild applause?

The truth is, conventional ways of measuring a computer's power don't have very much to do with the power a computer gives you to accomplish anything.

A personal computer can't do anything by itself. And a computer that people can't — or won't — use doesn't really have any power at all.

So don't judge Macintosh' personal computers on the basis of hardware alone. (Although Macintosh can match up chip for chip, microprocessor for microprocessor, to any personal computer in the world.)

And don't judge Macintosh on the basis of software alone. (Although Macintosh lets you run more programs than any other personal computer in the world.)

Instead, judge Macintosh on the basis of what people and Macintosh achieve when you bring them together.

While all too many PCs spend most of their time doing nothing, like the computer on the left, you'll almost always find Macintosh computers like the one on the right. With human beings attached. Hour after hour. Day after day. Helping them do almost everything.

A recent survey of people who use Macintosh personal computer systems and people who use the other leading personal computer system in Fortune 1000 cor-

porations helps explain why: Macintosh was rated 22% higher for user enjoyment. Which, in turn, helps account for why information systems managers in those companies rated Macintosh 22% higher for overall satisfaction and a remarkable 42% higher for user productivity.

So before you spend another dime on personal computers, invest a few minutes in a system that lets you measure its power by the only benchmark that really matters: the performance of the people who use it.

For the location of your nearest authorized Apple reseller, please call 1-800-538-9696, ext. 800.

Then you'll know why Macintosh is the most powerful personal computer you can buy today. The computer people actually use.

The power to be your best. •



#### CALENDAR

"Global Communications: Worldwide Connectivity Strategies," is the theme of a June 14-15 conference for companies that have, or are planning, an international presence.

The conference, to be held in Washington, D.C., will address the issues of technical and regulatory trends, including deregulation, demonopolization and privatization, and how those changes affect the networking alternatives available to multinational corporations for their global communications needs.

Featured speakers will include Gene Donlan of Fujitsu America, Inc., Robert Seifert of State Street Bank, Stanley Welland of General Electric Co., William Caton of Smith Kline Beecham, Charles Russell of Dow Jones & Co. and Robert Lantto of Cargill, Inc.

For more information, contact Infoline, Inc. in New York at (212) 557-3400.

#### MAY 20-26

Lap and Palmtop '90. New York, May 21-22 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

Increasing IS Productivity. Cambridge, Mass., May 21-23 — Contact: Jay Delaune, Index Group, Cambridge, Mass. (617) 499-1373.

TCP/IP & OSI. Washington, D.C., May 21-23 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

**Xhibition '90.** San Jose, Calif., May 21-24 — Contact: Sarah Lummas, Integrated Computer Solutions, Cambridge, Mass. (617) 547-0510.

**Unix System Seminors.** Boston, May 21-25 — Contact: Padcom Associates, Orange, N.J. (201) 678-7323.

**AD/Cycle Conference.** Chicago, May 22-24 — Contact: Case Research, Inc., Bellevue, Wash. (206) 453-9900.

CASE Tool Laboratory Symposium. Grand Rapids, Mich., May 22-24 — Contact: Dr. Paul Jorgensen, Research and Technology Institute of West Michigan, Grand Rapids, Mich. (616) 771-6800.

**Executive Uniforum Symposium.** Santa Barbara, Calif., May 22-24 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

Retoll Systems '90. Dallas, May 22-24 — Contact: Conference Director, Retail Systems, Newton, Mass. (617) 527-4626.

Semicon/West '90 Show. San Mateo, Calif., May 22-24 — Contact: Advantest, Lincolnshire, Ill. (312) 634-2552

Electronic Marketing & Retail Conference. Orlando, Fla., May 23-25 — Contact: Deloitte & Touche, San Francisco, Calif. (415) 296-2000.

IBM Token-Ring and SNA. San Francisco, May 23-25—Contact: Kaptronix, Haworth, N.J. (201) 769-4250.

International Conference on Project Management, Planning and Estimation. Buena Vista, Fla., May 23-25 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Online. San Francisco, May 23-26 — Contact: Nan Hanahue, Allentown, Pa. (215) 821-7777.

Dato Administration in the 1990s. Chicago, May 23-25 — Contact: Performance Development Corp., Princeton, NJ. (609) 921-3770.

#### MAY 27-JUNE 3

Advanced Security and Identification Technology Conference and Exhibition. Washington, D.C., May 29-June 1 — Contact: Paul Oyer, The Information Exchange, Woodbridge, Va. (800) 223-8128.

Empowering America's Industrial Competitiveness Conference. Fairfax, Va., May 29-June 1 — Contact: The National Coalition for Advanced Manufacturing, Fairfax, Va. (703) 323-2198.

International Smart Card Applications and Technologies Conference. Washington, D.C., May 29-June 1— Contact: The Information Exchange, Woodbridge, Va. (703) 490-8615.

Federal Information Systems Conference. Alexandria, Va., May 30 — Contact: John D. Geron, EIA, Washington, D.C. (202) 457-4944.

Unique Telecommunications Symposium (UTS '90). New York, May 30-31 — Contact: UTS '90, Kings Park, N.Y. (800) 438-1242, ext. 535.

International Trade and Computerization Conference. New York, May 30-June 1 — Contact: NCITD, New York, N.Y. (212) 925-1400.

Personal Computers and Workstations Conference. Washington, D.C., May 30-June 1 — Contact: U.S. Professional Development Institute, Silver Spring, Md.

(301) 445-4400.

**1990 International Summer Consumer Electron-Ics Show.** Chicago, June 2-5 — Contact: Consumer Electronics Shows, Washington, D.C. (202) 457-8700.

**Comdex/Spring '90.** Atlanta, June 3-6 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

World Industry Congress VII. Washington, D.C., June 3-6 — Contact: Education Department at Adapso, Arlington, Va. (703) 284-5355.

#### **JUNE 4-10**

**Networking PCs.** Boston, June 4-5 — Contact: Andrea Shear, Boston University, Boston, Mass. (617) 570-8066.

**1990 Information Monogement Conference.** Toronto, June 4-6 — Contact: John Hobbs, Toronto, Ont., Canada. (416) 738-2337.

ISDN '90 Conference and Exposition. Denver, June

4-8 — Contact: Information Gatekeepers, Boston, Mass. (617) 232-3111.

MIS Training Week. Arlington Heights, Ill., June 4-8 — Contact: Phyllis Drum, Framingham, Mass. (508) 879-7999.

Costing and Chargeback Workshop. Long Beach, Calif., June 6-8 — Contact: The Institute for Computer Capacity Management, Milpitas, Calif. (408) 954-0114.

Midwest Wang Users Conference. Chicago, June 6-8 — Contact: United States Society of Wang Users, Chicago, Ill. (708) 652-3888.

Outsourcing of Information Systems. Reston, Va., June 7-8 — Contact: Input, Mountain View, Calif. (415) 961-3300.

Executive Symposium on Automated Mapping/Facilities Management/Geographic Information Systems. Keystone, Colo., June 8-11 — Contact: AM FM International, Englewood, Colo. (303) 779-8320.

#### To find out how easy it is to convert DCA's new IRMA from standard to MCA bus, flip the page.



#### CLIPS



Tim Lewis

Summaries from leading scientific and management journals

#### Journal of Information Systems Management

Spring 1990

"An MIS Manager's Guide to Hiring Programmers" By Janet Ruhl

■ By rethinking the search and hire process and knowing how in-house human resources operates, managers can hire talented and happy programmers — and wallop fair chunks of time and dollars from recruiting budgets.

First, realize that HR personnel are rarely savvy in the field of programming. Instead of citing minimum requirements such as expertise in a specific program-

ming language or mastery of a mainframe database, think in broad terms of the aptitudes and personality traits that would make a candidate successful.

Second, do not demand a specific level of education. Requiring a four-year degree in computer science will knock out a large percentage of able candidates who may have attended college before computer science was an available major.

Next, do not exaggerate the importance or benefits of the position to lure applicants. If someone accepts a position believing it to be more managerial or more varied than it really is, you will have an unhappy new hire on staff who will have no qualms about leaving the company at the first opportunity.

Finally, interview applicants yourself.

Human resources representatives will frequently eliminate candidates because they are unsure of their suitability or confused by their acronym-filled resumes.

#### University of Minnesota Management Information Systems Research Center

Working Paper 1989

"The Economics of Data Integration" By Dale Goodhue

The corporate challenge of determining an appropriate level of data integration is balancing effective communications with the least possible cost. Most companies will find it more desirable to partially integrate their data islands rather than to go to the extreme of total integration or total lack of integration.

A major cost of integration crops up in trying to agree on a single network design. Other costs are associated with loss of local autonomy and flexibility, translating nonintegrated data into a compatible form and the extra managerial time spent making decisions with nonintegrated or partially integrated data.

Data integration benefits include facilitating corporatewide actions and making information available for companywide decisions.

The optimal degree of integration will vary with the number and diversity of subunits in a company, extent of centralization and emphasis on corporatewide vs. local-level activities and decisions.

#### California Management Review Winter 1990

"Beyond the Charismatic Leader: Leadership and Organizational Change" By David A. Nadler and Michael L. Tushman

A charismatic executive is not enough to steer a firm through large-scale organizational changes. While an inspired individual is critical to provide vision, direction and energy, different changes call for different types of leader-

One of the most challenging changes to manage is reorientation, a strategic change for future competitive advantage. An individual executive is severely limited by his own time, energy and expertise to deal with the demands of such change. Two other forms of leadership are key in successful reorientations.

Instrumental leadership focuses on defining the behavior needed to achieve change and ensuring that employees continue that behavior. It consists of three elements: building competent management teams to communicate the desired behavior; creating processes to assess behavior; and establishing systems to reward or punish behavior consistent or inconsistent with the goal.

Institutionalized leadership entails expanding the number of people who perform leadership functions. This concept consists of three elements as well: developing an effective and visible senior management team, broadening the senior management level to include individuals one or two steps down from the executive team and developing future leaders in the organization to fit with the future environment of the reorientation.

#### You got the idea.

You've never seen anything
like IRMA 3 Convertible™ from
DCA® It's the only terminal emulation board that works on both
a standard and MCA bus.

So now you can buy the best in micro-to-mainframe communications, and protect your investment, even if you change PC architectures.

You see, IRMA 3 can run on all current PCs. It uses an exclusive dual bus design that enables it to provide terminal emulation in PCs with the standard AT bus architecture or, by just flipping it over, it provides the same function in IBM® PS/2®s using Micro Channel Architecture.

For even more flexibility,
the IRMA 3 Convertible is capable of CUT or DFT-mode emulation.

You can use DCA's emulation software: E78 Plus<sup>™</sup> for DOS and OS/2,® IRMAX DFT,™ 3270 APA Graphics,™ Windowlink™ for IRMA, as well as IBM's software, including IBM OS/2 Extended Edition. And it lets you directly connect the most cost-effective cabling solution for your needs: coax or twisted-pair. For more information on the exciting new IRMA 3 Convertible call 1-800-241-IRMA ext. 59E.\* In this complex, ever-changing technology environment, you're not going to find a more flexible connectivity product. Going forward, or backward. IRMA 3 Convertible 3270 Adapter Hardware

\*Or call 1-404-442-4500 ext. 59E. © 1990 Digital Communications Associates, Inc. All rights reserved DCA is a registered trademark and IRMA 3, E78 Plus, IRMAX DFT, 3270 APA Graphics and Windowlink are trademarks of Digital Communications Associates, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

#### **EXECUTIVE REPORT**

IS IN FINANCIAL SERVICES

### Wall Street cultivates a lean and hungry attitude

#### BY DAVID LUDLUM

rom their Manhattan office towers, managers of the nation's leading brokerage and investment banking firms can see shiploads of business opportunity on the horizon. However, the question along Wall Street is whether there is enough cash in the till to build adequate docks.

Last month, for example, the Securities and Exchange Commission loosened its regulation of the private placement of securities. The change made it a lot easier for corporations to sell stocks and bonds directly to big institutional investors. Wall Street's investment banking and brokerage firms expect that business to grow rapidly. They are jockeying to become bigger players, and that means sinking money into new systems.

Right now, however, cash for capital investments is a commodity that is in rather short supply. After the 1987 market meltdown, demand fell for services such as retail brokerage. For a while, other activities, including mergers and acquisitions, picked up the slack, but those have also slowed. Even where services remain in demand, profit margins have come under pressure.

Take securities trading, for instance: The falling price of computer power has let institutions that buy stocks and bonds do sophisticated analyses of prices that only brokers and dealers could do in the past. The result is a smaller spread between bid and ask prices and slimmer profit margins for the sellers.

"The playing field is being leveled. That has changed the business fundamentally," says Gary Curtis, a vice-president in the Chicago office of the Boston Consulting Group. Wall Street companies are saddled with overhead costs originally justified by the profit margins of the past.

Ludlum is a *Computerworld* senior writer.



Joyce Ravid

Goldman Sachs' Adam points out the paradox between reduction expectations and new introductions

"There's a real paradox here," says Rick Adam, a partner in charge of global operations and information technology at Goldman, Sachs & Co. "The traditional products that paid the bills for a few years have slowed down, so people say you should be able to cut back. But traders and salespeople are accelerating the rate of new product introductions"

The new products also tend to be more complicated than the old ones. Goldman Sachs, for example, recently became a market maker for Japanese equity warrants traded in London. To

handle the Japanese warrants,-Goldman Sach's traders have to have real-time prices of the underlying Japanese stocks and calculate the impact of changes in them on prices for warrants. "A client will call, and you have to be able to give him a quote," Adam says. "From a computing point of view, it's quite tricky."

The company equipped traders with personal computers running Microsoft Corp.'s Windows. The desktop machines are tied to Stratus Computers, Inc. minicomputers and IBM hosts through a cooperative processing scheme, so that the traders

get power and responsiveness and the ability to track the mainframe-based inventory.

Goldman Sachs is actually in better shape to deal with the development of complex new systems than are many of its rivals. Firms that tried to offer a broad array of products and services during the heady 1980s face the toughest challenge, according to industry analysts. Organizations that once spent freely and put on fat are now eliminating entire lines of business. Last year, for example, Merrill Lynch & Co. took a \$470 million charge for restructuring, including the sale of its Canadian brokerage operations. Also, last month, Shearson Lehman Hutton, Inc. posted a \$630 million charge for restructuring, divesting part of a money management business.

Even at companies where such radical cutbacks are not necessary, expenditures are still being watched closely. Goldman Sachs, for example, has no standing order to cut costs, but the firm is generating efficiencies to help finance new projects. Its information systems budget has fallen slightly in the past year, Adam says.

Similarly, Salomon Brothers, Inc., which earned \$119 million for the first three months of this year, imposes strict requirements for the justification of any new systems projects. Managers must break each initiative into its component parts and forecast the cost and payback for each one.

For the most part, it's a matter of fewer dollars chasing many more priorities. New products and services have to be developed to repair frayed profits, and those products are often more complicated to support than the traditional lines of business. In areas in which margins have thinned, companies are looking for systems that can help traders make the most profitable use of their time. Many existing systems, which are nearly obsolete after a decade of sweeping change, need to be replaced. Others, thrown together in haste during the boom years to answer specific and pressing

75

#### INSIDE

Keeping assumptions current

Fast-response systems
Page 87

The shape of services to come



#### Guess how many ways AT&T o

12 you say? Maybe 45? Possibly 150? Guess again. Did you know that with AT&T, there is virtually an infinite number of ways you can break out billing? With AT&T DETAIL MANAGER, if you want your billing data broken out by city, we'll do it. Or

your billing data broken out by city, we'll do it. Or maybe you'd prefer it broken out by state, area code, frequency of usage, cost category or length of call? And if that's not enough, you can use our free PC software to design your billing data to suit your needs.

And the options don't stop there. Billing reports

can be delivered on paper or magnetic tape. Plus many of these reports are free of charge, and most of them are offered with all AT&T calling plans, including AT&T WATS and the AT&T 800 Family of Services.

You can depend on AT&T for accuracy of billing, too. Because with our 100% hardware answer supervision, you'll never be charged for uncompleted calls.

So the answer to this guessing game is, whatever way works best for you. Any other way isn't worth a hill of beans.



#### ın help you detail your billing.

If you sign up now, you can get up to three management reports on paper or magnetic tape, or call detail on floppy disks, each month free of charge through your September bill. The earlier you sign up, the more free reports you get.

AT&T DETAIL MANAGER. Another AT&T advantage.

For more information, contact your AT&T Account Executive or call 1800 222-0400.



#### **Wall Street**

FROM PREVIOUS PAGE

requirements, must now be reconciled and integrated into companywide architectures. Finally, but far from the least of concerns, the denizens of Wall Street know that they must construct and maintain a coherent systems structure so that they will be able to compete when business picks up and competition hits with full force.

Distributed processing is a top-of-the-list item at many firms. IBM mainframes are the popular choice for transaction processing on Wall Street, but firms embrace different approaches to distributed processing. Many rely primarily on IBM

Financial institutions used to want systems to help them work faster;

Top benefits desired from information systems

From a survey of 217 commercial lenders, savings and loans and securities firms

now they hope systems will help them work better

Higher productivity

Increased effectiveness

Better customer support

Fine tuning

Source: The Sierra Group, Inc.

Personal System/2s, but Salo-

mon Brothers has committed it-

self to the Unix operating sys-

tem: The aim is to leave users

free to respond to changing

on networks of IBM-compatible

PCs, which are tied directly to

mainframes and do cooperative

processing. Adam says PC local-

area networks can do almost

anything minicomputers can.

The firm is piloting some Unix-

based systems, and Adam pre-

Goldman Sachs relies chiefly

0

2

nomic trends that could affect their value. "These traders often work on very, very thin margins and rather subtle signals to tell them what to do," says Mark Klein, a senior vice-president at The Diebold Group, Inc., in New

To give traders all the information they need, companies must integrate workstations with back-office mainframes that clear the trades, transfer securities and generate reports for management and regulators. Traditionally, the mainframes issued reports overnight through batch links, but that approach is not good enough for today's fastpaced trading. Real-time links tell traders which securities the company holds so they won't sell ones that someone else just sold

N A FAST-CHANGING BUSINESS, Wall Street firms need technology that lets programmers build systems quickly and modify them or move them among hardware platforms easily. But top management has to recognize the value of such seemingly "pedestrian" capabilities.

operate on LANs running off mainframes in New York. The new system provides retail brokers with real-time transaction data from the mainframe rather than overnight updates.

Investment banking and brokerage firms are also finding other ways of making technology investments pay for themselves. In a few instances, systems developed for internal use have been put on the market as commercial products. One example is First Boston Corp.'s global trading system. Having developed a first-of-its-kind, 24-hour trading system boasting both distributed architecture and full integration between front and back offices, First Boston formed a joint-venture with IBM, called Seer Technology, to sell both the system and the computer-aided software engineering technology used to build

At other firms, the strategy is to build cost reduction into system design. By adding functions to its global system for clearing security trades, for example, Goldman Sachs has eliminated the use of third-party clearing agents in various parts of the world, saving millions of dollars, Adam says.

**S&L PRIORITIES** 

Top technology issues cited by savings and loans

- 1) MS-DOS
- 2) Personal computer integration
- 3) Multivendor compatibility
- 4) Multivendor connectivity
- 5) IBM's Systems Network Architecture

From a 1989 survey by The Sierra Group, Inc.

Salomon's Dramis listens to the department footing the bill

dicts Wall Street will use more Unix workstations for high-power applications, such as trading, while the hordes of salesmen will work with less expensive PCs.

Supporting traders in a distributed fashion is a complicated proposition. A customer might trade one security for a package of 16 others. Traders need information on the potential buyers or sellers, the companies that issued the securities and the ecoor buy ones that someone else from the company just bought. The links also make the back

1989

Increased effectiveness

Better customer support

Ability to expand business

CW Chart: Marie Haines

offices more efficient. Some traders still scribble down information on transactions, which has to be keyed in by back-office workers. "Passing around tickets with coffee stains and illegible handwriting isn't a very good way to do it," Curtis says. With real-time integration, a trader can key in data and send it to the back office, where systems pull up information such as delivery procedures for the customer.

Real-time integration is crucial in assessing risk. Without it, managers cannot see the firm's holdings in a particular currency or what business it is doing with a given customer, industry or region. But that is not the only reason that distributed processing is such a hot item on Wall Street agendas. Part of the attraction is also that companies see such a move as one way to combine strategic benefit with cost reduction.

Fixed costs account for a big proportion of total expenses for Wall Street firms, Klein says, and one very big fixed cost is mainframe investments.

The idea of reducing mainframe storage and processing costs while also easing access to data exerted strong appeal for Merrill Lynch, says Howard Sorgen, director of information processing and technical services. The company is three-fourths of the way through a project to replace 17,000 terminals at 480 branch offices with PCs, which

In addition, a number of Wall Street companies are working on technologies that could someday work as substitutes for services of the New York Stock Exchange, which charges member firms as much as \$20 million a year. Shearson is making its own market in about 50 Big Board issues, mostly closed-end stocks.

At the same time, companies are plunging ahead with investments aimed first at boosting competitiveness. In developing software, Merrill Lynch is adopting wide-scale standardization of software development to allow programmers to bring products to market more quickly. "Eventually, it will be more cost-effective, but the driving force isn't cost reduction; it's competitive edge," Sorgen says.

This kind of initiative faces the give-and-take of negotiation. At Shearson, standard procedure calls for a committee chaired by the chief administrative officer to review business requirements and approve spending for new systems. It's a tough process, and the bottom line is return on investment, says Rick Morrison, a co-chief administrative officer and head of systems. If a manager can't demonstrate a sufficient return, his project is put off until he can.

On Wall Street, most proposals for spending on technology originate with a business unit, such as an equity or fixed-income trading department. It is typically these user groups that must prioritize projects in making budgets. "We don't do anything without the approval of the people who are paying the bill, and those are the people who are working on the revenue-generating side," says Fran Dramis, Salomon's managing director in charge of systems.

At Merrill Lynch, managers in the central processing group sometimes work out cheaper ways to do things in response to requests from business units.

They forecast their expenses by meeting with the top managers of the units and, subsequently, with the software development staff. One step they have taken is discounted rates for processing services delivered during off-peak hours, which discourages business units from using mainframes during prime time. "We turn that cost savings back to the business cli-

ent," Sorgen says.

At Kidder, Peabody & Co., Robert McKinney, the firm's managing director of systems, has a say in setting systems budgets as a member of the management committee. In that func-

tion, he has advocated such projects as the purchase of a new trading system and automation of branch offices. Kidder's IS people and business unit managers prioritize projects with help from software that tracks requests for new systems and work in progress.

Kidder, which occupies something of a mid-

dle ground in profits and pressure to cut costs, is trying to eliminate less important activities to free resources for new projects. Part of the effort flows from a recapitalization by its parent firm, General Electric Co., in March. In the wake of the financial restructuring, managers are rooting out unnecessary work and inefficient methods. They decided, for example, that needs didn't justify their state-of-theart, minicomputer-based publishing system, so they replaced it with less expensive desktop



Morrison says Shearson wants projects with payback

publishing machines.

Companies have set their sights on a variety of other areas for cutting costs. Merrill Lynch's current effort began in 1986 — long before its recent restructuring — when it hired DuWayne Peterson to ride herd on systems, telecommunications and operations. The thrust has been to consolidate processing and communications, charging business units for services while decentralizing software development among them.

Sorgen says Merrill Lynch is centralizing "utility-like functions" while spending money on strategic initiatives such as structured software development. It plans to cut the costs of central services by 5% to 8% a year; since 1986, it has reduced the ranks of workers providing the services by one-fourth.

A key move has been the consolidation of seven data centers into two "megacenters" designed to provide operational redundancy. This change, which was completed last year, is bringing savings of more than \$28 million a year, Sorgen says.

Data center standards and automation are helping Merrill Lynch and other companies take care of business with fewer people. Merrill Lynch standardized

#### **SECURITIES PRIORITIES**

Top technology issues cited by securities firms

- 1) Personal computer integration
- 2) MS-DOS
- 3) Multivendor compatibility (tie) Multivendor connectivity (tie)
- 4) Common user interface

From a 1989 survey by The Sierra Group, Inc.

#### EXECUTIVE REPORT

operating systems and scheduling and installed software for monitoring and controlling networks, T1 lines and modems. "The idea is a lot of sophisticated equipment with very few people," Sorgen says.

Kidder has installed data center automation for backup, job control, tape library management, report distribution and transfer of data among incompatible systems. The company leases data center facilities from First Boston but runs its own computers with its own people. Kidder has cut its information systems head count from more than 400 to "the low 300s" in the last two years, according to McKinney. To keep employees motivated and focused on their work — a major challenge — managers hold regular meetings to address concerns of staff members.

#### Critical ties are prime target

Communications costs have long been a major expense for Wall Street companies and, therefore, a major target of budget-cutting efforts. In recent years, Goldman Sachs has "re-engineered" its network, Adam says. It uses a fiber-optic backbone for voice, data and video moving between the U.S., London and Tokyo. The company has lowered costs 30% while boosting the quality of transmissions and allowing seven-digit dialing worldwide, Adam says.

Shearson has introduced fractional T1 lines to connect certain locations where full T1 would be too expensive to justify. Multiplexer vendors design and help install the networks, which are cheaper and more reliable than conventional analog circuits.

All the companies are cutting costs by bargaining more aggressively with vendors. They are taking advantage of negotiated rates for telecommunications, such as AT&T's Tariff 12. Merrill Lynch has tapped MCI Communications Corp. as its sole telecommunications provider. In a turnaround, however, it recently backed off from a plan to outsource network management to MCI and IBM. Top management decided network control is too critical to outsource, Sorgen says.

Shearson has been cutting better deals with suppliers of computer equipment and communications services through the buying power of its parent, American Express Co. McKinney says Kidder is saving money by buying First Boston's global trading system. "Today, it would cost anyone \$100 million to build," he says, while purchasing it cost a small fraction of that amount.

At Shearson, the focus of cost-cutting

#### COMMERCIAL PRIORITIES

Top technology issues cited by commercial lenders

National firms:

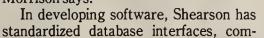
- 1) IBM's Systems
- Network Architecture
- 2) Multivendor compatibility (tie) Fault tolerance (tie) MS-DOS (tie)
- 3) Multivendor connectivity

Nonnational firms:

- 1) MS-DOS
- 2) Personal computer integration
- 3) Multivendor compatibility
- 4) Common user interface
- 5) IBM's Systems Network Architecture

From a 1989 survey by The Sierra Group, Inc.

is software development. The company is redesigning software to run in a more efficient parallel mode on the six-processor **IBM** mainframes in its new Manhattan data center. The idea is to accommodate business growth with minimal increases in hardware costs. "We don't want to build these mammoth systems that are CPU hogs," Shearson's Morrison says.





At Merrill Lynch, Sorgen urges off-hour processing

munications and presentation. "The term we use is 'snap-on," Morrison says. With the approach, development is less labor-intensive and more simple; programmers don't need to know the operating system in as much detail as before. Since applications look more similar, maintenance is easier, too, he says.

At Merrill Lynch, business units do their

own software development, but the central services group provides processing for them. It is cutting costs by offloading

some of the work to PS/2s. The firm thinks each programmer is costing 16% less in processing resources, Sorgen says.

State-of-the-art software development is definitely an area in which Wall Street firms need to invest, says James Emery, a professor at the University of Pennsylvania's Wharton School. In a fastchanging business, they need technology that lets programmers build systems quickly and modify them or move them easily among hardware platforms. But top management has to recognize the value of such seemingly "pedestrian" capabilities. Given pressures to cut costs. Emery says. it's becoming harder to get money for investments that are perceived in this way. "But," he adds, "I'm extremely bullish about it in the long run." •



# Bye-bye

Now there's a way to solve your software development backlog problems.

And Digital has it today.

It's the only kind of solution to the problems of developing software that really works.

A total solution.

It's Digital's complete CASE environment. It gives developers of commercial and technical applications a totally integrated approach to software development—something that's essential to the software development cycle and accelerates it in ways that CASE tools alone never could.

■ WRITE ONCE AND FOR ALL.

What's so unique about Digital's CASE environment is what it lets you

do. That's because it rests solidly on a foundation of architectural standards that are both open and flexible.

A case in point. Our CASE tools are supported by Digital's Network Application Support (NAS). Digital's NAS lets you develop applications for computers with one operating system, yet run them on different computers with different operating systems. The competition can't offer this level of integration for saving time and money.

■ A FRAMEWORK THAT REALLY WORKS.

We also offer a CASE integration framework, specifically designed for software development. As with our architectural standards, the framework is open, flexible and complete.



# backlog.

For example, it offers the industry's first distributed CASE repository. Consequently, team communications, process management, data and information sharing and other functions that make development faster and easier are integrated. What's more, 3rd party products and tools can also be integrated.

THE COMPLETE TOOL CASE.

Then there are the tools themselves. Here too, Digital offers more. We provide a complete set of industryleading tools for every aspect of the development cycle. These include tools for information systems, transaction processing, technical, scientific and embedded applications and more. ■ A SUPPORTIVE ENVIRONMENT.

And finally, there's support. As with everything else we offer for our CASE environment, our support is allencompassing. Count on things like training, consulting, special courses, worldwide service and even CASE integration services.

To be effective and productive today, you need the right tools. But, more important than that, you need the right environment. Find out now what a difference Digital's complete CASE environment can make. Call 1-800-842-5273 ext. 315. Or call your local Digital sales office.

Digital has it now.



WE'RE THE T1 SUPPLIER WITH TOTAL **NETWORK SOLUTIONS.** 

It may not be common knowledge, but Codex has been connected with T1 and other digital technologies almost as long as T1 has been connecting information centers.

In fact, Codex was one of the first to see the cost and availability advantages of fast packet technology for T1 networks.

But no T1 network can stand alone. It has to be part of a complete network solution. And there's no T1 supplier better at total network solutions than Codex.

We have 28 years' experience designing, installing and supporting multi-technology networks in 44 countries worldwide. Including more T1 fast packet networks than anyone else.

Which explains why we can offer the best solution for integrating T1 into your current information systems environment.

If you'd like to learn more about our T1 capabilities, call us at 1-800-426-1212 ext. 7232. We'll send you a free copy of our "Applications Booklet of T1 Fast Packet Technology." It's the first step in finding out what our experience can do for you.





(M) MOTOROLA



#### INTERVIEW

#### Staying in step with the times

KPMG Peat Marwick's Erich Sippel says 'traditional' financial services firms need better performance-measuring systems to keep up with changing market realities

he basic definition of financial services is fairly simple, says Erich W. Sippel, senior manager at KPMG Peat Marwick in Philadelphia and New York; it means getting those with money to lend together with those in need of investment funding.

This exchange, however, can be structured in innumerable ways. Traditional financial services institutions, including banks, thrifts and insurance carriers, are facing a creative challenge from rivals such as securities firms and insurance brokers.

Ultimately, Sippel says, the financial services providers that will thrive will be those that spot possibilities for innovation in investment instruments. Computerworld Features Copy Editor Cathleen Duffy recently spoke with Sippel about what socalled traditional firms must do to keep up.

#### What are the biggest strengths of the newer financial services provid-

I like to think of these newer rivals as creators of financial innovations. These are the companies that have come up with innovations such as money-market and mutual funds, junk bonds, mortgage-backed securities and noninsurance methods for managing property and liability risk.

#### What kind of an advantage has this creativity given them over the more traditional providers?

The biggest advantage they have is being able to meet the same market needs in ways that are less capital-intensive.

There are five basic ways to make money in financial ser-

- 1) You can assume someone else's risk.
- 2) You can manage the spread, which means obtaining money cheaply and lending it expensive-
- 3) You can aggregate, which means managing money in something like a mutual fund, without assuming any of the risk.
- 4) You can process information by handling transactions, admin-

istering accounts or gathering, reformatting and selling investment data.

5) You can act as a distributor, selling financial instruments on behalf of the originator and/or reselling them in the secondary market.

I've listed these possibilities in order of their capital intensity. What that means is that if most companies are meeting the current need of the market by managing the spread and you can do it by processing information, you win. Or, if they're doing it in any of the first four ways and you can do it by distributing, you win.

#### Is the problem that the traintermediaries ditional shy away from change and risk?

They don't exactly shy away, but they are prisoners of the patterns of thought and perceptions built into the traditional paradigm of the financial services industry.

Their cultures are basically risk-averse. This sort of thing happens to companies of all kinds. They start out as entrepreneurial, risk-taking ventures, but, over time, they evolve and are taken over by professional managers and bureaucracy. That's OK if the environment remains stable. But if the environment starts to change, it can mean real trouble.

#### What kinds of measures will enable traditional providers to survive in the financial services world?

They're very used to thinking in terms of conventional categories — banks, thrifts, life insurance companies. What I'm saving is that those categories are becoming irrelevant, and these companies will go a lot further if they stop thinking in terms of old definitions and start thinking in terms of what market needs they meet, how they make money and what the return on capital investment is from that method of making money.

I like the quote by Charles Revson, the founder of Revlon, who said: "In the factory, we manufacture lipstick, but in the store, we sell hope." People buy something important to them; they don't buy what companies decide to manufacture.

#### Do traditional providers need to change their work processes for their product innovation?

I can't answer that across the board — some do and some don't. But virtually everybody needs to put systems in place to measure performance. They need to be able to answer questions such as: What market need are we meeting? How much of our capital is tied up in that? How much money do we make? And



Sippel: Firms will go further if they stop working with old definitions

what is the return on invested capital?

Those are pretty fundamental questions for any business, and yet, hardly anybody in financial services can give you hard-edged answers to those questions.

#### Why can't they?

One reason is that systems inside companies are not set up to gather that kind of information.

#### Could a change in the way they use information technology help?

It primarily depends on how the company is going to make money and what its strategy is. Nevertheless, I think that it's safe to say that in all of these companies, their end product is information, so they've got to be able to process information effectively. It's part of the cost of entry into the whole game.

If you're going to make money by processing information and you're going to do it by processing transactions, you've got to recognize that this is a business a lot like traditional manufacturing, where big economies are derived from scale, and the key to success is getting down the experience curve quickly. That argues for heavy investments in technology.

#### How do the traditional providers' investments in information systems com-

pare with those of their newer rivals? They spend a lot of money. But everyone in

the financial services arena spends a major amount of money on technology. Securitized mortages compete with mortgage lending. Salomon Brothers largely invented securitization. So, if you're asking, does Salomon Brothers spend more money on technology than the typical large thrift and is that the key to their success, the answer to that question is I don't know. Everybody spends a lot. Is that the key to the success of the innovation? The answer is no.

#### Can technology and the people who manage it help spark innovation?

Let me tell you about one client of mine. This client asked me to help them figure out what they should do with technology, marketing and customer service. I came in and realized they really didn't have any strategy. They had a lot of ad hoc decision-making, and they had a lot of projects. They were very bright, capable people, but there was no overall coherent approach to the marketplace. Without that kind of frame of reference, I couldn't answer the questions they were asking. What you're going to do with technology depends on what you're going to try to do as a business. What I had to do was help them figure their overall strategic approach. Once that was possible, then the implications for technology, customer service and marketing were

### As Global Competition Systems Must Change To



## Intensifies, Information A Competitive Weapon.

Economic experts agree that the 1990s will see unprecedented competition in global markets.

Key to your company's survival in this new competitive environment will be the adoption of a new computing strategy in which information systems can truly become a competitive weapon. A strategy far more flexible and able to adapt rapidly to change than those of the past.

Multivendor Distributed Environment Superior Quality Intuitive User And Reliability Environment Access To Enterprise-Wide **Avallability** 

Open, Cooperative Computing is NCR's blueprint for such a strategy. Its openness gives you the widest possible choice of hardware and software. So you can add applications and functionality quickly.

Its client/server architecture lets you distribute computing resources more efficiently. Its intuitive graphic interface gives you transparent access to information enterprise-wide. So you can respond to customer and market needs more quickly and more effectively.

And it provides a bridge to your current information systems that preserves your present investment in systems, applications, and data.

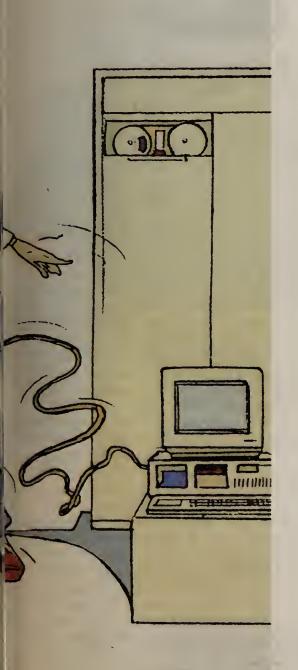
NCR is a leader in open systems solutions. We build the most complete set of end-to-end, industry-standard products. And no one has more experience connecting multivendor environments, via SNA, OSI, and other communications methods.

Open, Cooperative Computing is a strategy that will shape the future of information systems. The time to begin implementing that future is now.

For details on how to turn your information systems into a competitive weapon, phone 1-800-CALL NCR.

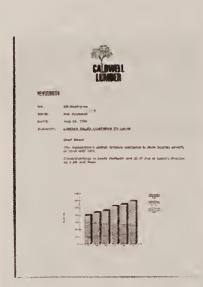


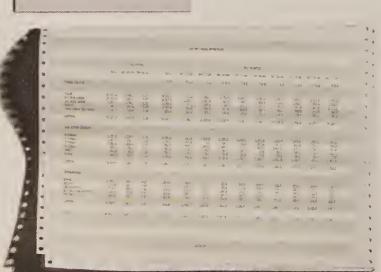
Open, Cooperative Computing. The Strategy For Managing Change.

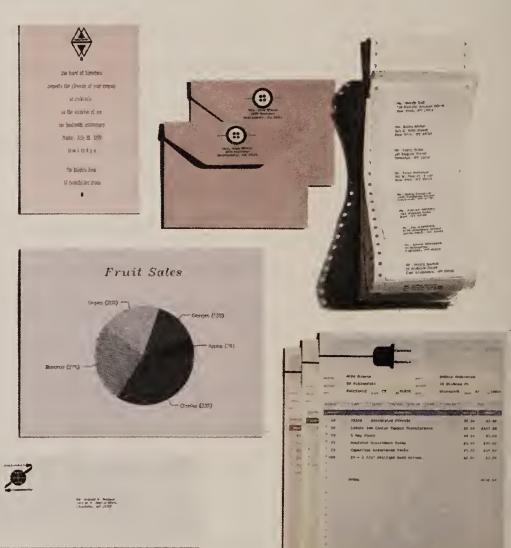


## Now save up to 20% on the family of printers that goes to any lengths (or widths) to please you.









New exceptionally competitive prices can now be added to the long list of the IBM Proprinter's selling points.

The IBM Proprinter<sup>™</sup> family is the kind of family that can't do enough for you.

And now, with their new reduced prices, current IBM Proprinters will do it all even more economically. From multipart forms to correspondence and envelopes, to spreadsheets and mailing labels, to just about any other printing job.

Since all Proprinters share important IBM engineering design innovations, like streamlined mechanics and a convenient

front feed, they can accommodate this wide range of applications with exceeding ease, reliability and value.

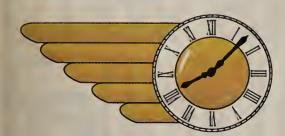
To see which competitively prieed IBM Proprinter best meets your needs, ask your IBM Authorized Dealer or IBM marketing representative to introduce you to the whole family and the new priees. Call 1 800 IBM-2468, ext. 226 for a dealer near you.





IBM is a registered trademark and Proprinter is a trademark of International Business Machines Corporation  $\,$   $\,$  1990 IBM Corporation  $\,$ 

#### Beating the clock



Time margins are slim in the financial services industry these days. Investors want to respond immediately and intelligently to quicksilver market changes. They also want this fast-response capability to stretch around the clock and around the world.

This imperative is fueling more innovative applications and ambitious leveraging of information systems and networks. Below are examples of companies stretching information and communications systems to cover new market needs.

#### Chicago Mercantile Exchange

The pits may close, but trading goes on. There is always action in some corner of the world, particularly when it comes to foreign currencies and Eurodollars, and that far-flung action is becoming too important to miss. That's why the Chicago Mercantile Exchange (the Merc) decided to partner with the Reuters information and newswire service in September 1987 to develop the Globex electronic trading system. Globex, currently in alpha testing, will extend trading hours long after the pits close, operating from 6 p.m. to 6 a.m. Chicago time.

"Laws have changed, says Jack Walsh, vice-president of Globex marketing. "Governments in countries like West Germany and Japan are now allowing the establishment of exchanges. Institutions and individuals in those countries can now trade futures from their homelands. We wanted to attract new participants, but we also wanted to protect our beachhead." The only way to do that, Walsh says, was to adjust trading hours to clocks in the new trading territories.



The Merc's Serpico

Buyers and sellers enter bids and offers using terminals called keystations. These statements are transferred to a host processor in Hauppauge, N.Y., for sorting and matching. Prices from successful matches are fed from Hauppauge to the exchange in Chicago,

which feeds them to 56 quotation distributors. The distributors in turn send prices to terminals worldwide. A clearing system processes trades and, at the end of each trading day, determines winners and losers, based on settlement prices. A process called the banking cycle transfers money from losers to winners.

The partners are dividing the technical tasks. Reuters is programming the host-matching and keystation systems, while the Merc is programming the ticker network and the clearing and banking systems, explains Donald Serpico, senior vice-president of operations.

The keystations are Intel Corp. 80386-based IBM-compatible personal computers with specially designed keyboards. The host processor in Hauppauge is a Digital Equipment Corp. VAX 8800. In Chicago, quotes and trades are processed through Tandem Computers, Inc. machines, then routed to the Merc's IBM 3090 mainframes, which perform the clearing process.

Globex is being alpha-tested in London, New York and Chicago. Beta testing is scheduled to start at the end of this month and run through June. The actual start date will be determined by the success of the beta testing. Even so, plans are already under way to bump up the network's capacity, Walsh says.

Security Pacific Merchant Bank

Administering syndicated loans — large loans broken up among a group of lenders — is a notoriously complicated business. But thanks to an internally developed system, Security Pacific Merchant Bank in New York is finding the job less onerous these days.

The system is the work of a two-man team — a consultant and an employee in the bank's Corporate Financing and Banking, Loan Sales and Syndications department. An ongoing project, the system speeds and simplifies the company's work as an agent bank coordinating tens of billions of dollars worth of syndicated loans.

Acting as the agent for loans is difficult in the first place, says Joe Holliday, the inside developer on the system and principal in charge of operations at the bank. "Now, the speed at which people are administering deals — as well as additional options for borrowers and short turnaround times — makes it very difficult to automate. But it's necessary."

To make a large commercial loan in the past, he explains, an agent bank would send invitations to as many as 40 to 60 other banks to join a syndicate as lenders. But now, in the interest of faster turnaround, fewer banks are solicited to lend larger amounts. This can only be done, however, with the proviso that shares in that investment can be resold to smaller banks.

As a result, the agent bank acts as the liaison between not only the borrower and the lead banks but also between the lead banks and the subparticipants.

Although this new process is faster, it is also very complicated. The agent bank must communicate all loan activity to all participants. Automating this process in the short time allotted required a radical approach.

Holliday doesn't believe in lengthy specifications. "We had to create complex databases and get applications up and running in no time, so we decided to throw the rules out the window and go," he says. Consultant Mike Joblin, at Rational Software Technology Co. in New York, and Holliday used both Corvision, an integrated computer-aided software engineering tool from Cortex Corp., and a modular approach to expedite the development task.

"When every deal has a new wrinkle, you want to automate the most common components," Holliday says.

The system was developed and runs on a VAX 6320. Used by loan managers and their operations staff, it now contains more than 300 reports, 700 menu selections and 100 data-entry screens.

The team's next job is to generate more management information reports. "In investment banking, we live in an environment of instant response," Holliday says. "We're trying to supply support that can squeeze as much as possible out of systems."

**Fidelity Investments** 

Expanding product choices, rapid regulatory shifts and more diversified portfolios all combine to make well-coordinated account services a must in the retail investment business, says Steve Jonas, senior vice-president of retail strategic business systems at Fidelity Investments in Boston.

When investors call these days, they seldom ask a single simple question, Jonas says. More typically, customers dial in with multipart inquiries that involve more than one existing account as well as other funds that interest them. They may need quotes or account balances, they may be responding to promotional mailings or they may want to discuss the feasibility of a particular investment or transfer.

Resolving questions this varied in the course of a single phone call is no small challenge. "We have 150 products and five million accounts," Jonas says.

Moreover, that information is scattered among different databases on different mainframes. "Brokerage accounts are not in the same place as mutual fund

accounts," Jonas says.
"The database that tracks problem inquiries is in one place, information on customer mailings is someplace else, and price quotes are in yet another place."



Fidelity's Jonas

A new and ambitious presentation application was the solution. In the

past, customer service representatives, who constitute the front line of the business, were connected to the firm's IBM mainframes via dumb terminals. They could interact with only one mainframe at a time and one screen at a time. Fidelity now has replaced those terminals with Intel 80386-based PCs that integrate information from a variety of mainframe applications using an in-house-developed customer service application.

The application, which uses hypertext, runs under DOS in Microsoft Corp.'s Windows environment. The PCs, located on representatives' desks at telephone centers in Boston, Dallas, Salt Lake City and Cincinnati, are connected by local-area networks to 386-based servers at the centers, which in turn communicate to remote mainframes in Boston and Dallas.

Because the software has an intuitive presentational layer, Jonas says, representatives need only point and click to initiate requests. They can call up customer profiles, detailed funds descriptions, tax information and account histories.

The system, which took 15 months from conception to first production installation, is in the early stages. It now has 120 users

"By the time the application is fully rolled out over the next two years, there will be 1,000 users," Jonas says.

FNN Data Broadcasting Corp.

Thanks to a unique blend of broadcast and satellite technology, subscribers to services of FNN Data Broadcasting Corp. in San Mateo, Calif., never have to wonder for more than a few minutes what the market is doing.

The company, a subsidiary of Financial News Network, Inc., broadcasts market information over an FM sideband to a mix of 80% individual investors and 20% corporate clients. All of FNN Data products rely on FM sideband and satellite technologies. Sideband is a subset of the frequencies used by FM carriers.

The company's approach differs from that of quotation distributors such as Reuters and Dow Jones & Co., which use leased lines to deliver information.

Newsreal is a new software product, which, through an arrangement with the Dow Jones News/Retrieval service, delivers financial news. The user tells Newsreal what to look for and when. For example, an investor might specify the computer industry, the categories of hardware and software and the companies. Customers can also set Newsreal to dial into the retrieval service at regular intervals.

Two older products — Quotrek and Signal — have been available for several years. Quotrek is a portable, handheld device that delivers real-time quotes. Signal is an FM receiver that plugs into an IBM Personal Computer. Each product can be used alone, but using Signal and Newsreal together, a customer can program Signal to control what information Newsreal dials up.

All U.S. exchanges use automated systems that capture all transactions, including shouted instructions and hand signals. This information is distributed through leased lines to many data distributors, including FNN Data. At FNN Data's computer center, that data is dumped into several VAXs, where it is indexed and continually updated. The information is then uplinked to a satellite, which transmits it to dishes at participating FM radio stations across North America. There the information is formatted and rebroadcast to customers.

FNN Data is considering the development of other broadcast technologies as information delivery mechanisms, says product manager Lee Siegfried. One possibility is to use vertical blanking interval on cable television, which is used for closed-caption broadcasts. Vertical blanking interval offers greater bandwidth, which means the possibility of supplying more kinds of data.

"Now, we just broadcast the last trade," Siegfried says. "Why not broadcast earnings per share, split information or relative strength indicators?"

By Barbara Francett, a free-lance writer in Bloomfield, N.J.

87

## Here are 43 reasons why the new controller



They all add up to one very important reason. The new IDEA Concert lets you integrate more hosts upstream and more devices downstream than any other controller on the market. IBM mainframes, IBM midrange systems, DEC VAXs, asynchronous hosts, coax, twinax and ASCII devices, you name it. All work in concert, so you can maximize your investments and increase productivity. The IDEA Concert Controller. And now, we'll let the numbers speak for themselves.

- 1. Talks to IBM 370 class mainframes
- 2. Talks to IBM AS/400 midrange systems
- 3. Talks to IBM System 3X midrange systems
- 4. Talks to DEC VAX systems
- 5. Talks to other asynchronous hosts
- 6. Talks to Unix hosts
- 7. Talks to multiple hosts (up to 4)

- 8. Talks to a combination of different host types
- 9. Talks to up to 56 coax devices
- 10. Talks to up to 42 twinax devices
- 11. Talks to up to 80 LAN devices
- 12. Talks to IBM 3270-type displays
- 13. Talks to IBM 5250-type displays
- 14. Talks to IBM InfoWindow displays

## everyone's talking about from IDEA Courier.

- 15. Talks to IDEA 9000 series terminals and printers
- 16. Talks to IDEA 12000 series terminals
- 17. Talks to IDEA 177, 197 and 277 series terminals
- 18. Talks to DEC VTXXX terminals
- 19. Talks to DECServer 200/550
- 20. Talks to IBM 3270-type printers
- 21. Talks to IBM 5250-type printers
- 22. Talks to IDEA 13000 series printers
- 23. Talks to IDEA 244 series printers
- 24. Talks to host-addressable PC printers
- 25. Talks to local devices
- 26. Talks to remote devices
- 27. Talks to a PC emulating a twinax terminal
- 28. Talks to a PC emulating a coax terminal
- 29. Talks to a PC emulating an ASCII terminal
- 30. Talks to Token Ring networks
- 31. Talks to DEC LAT networks
- 32. Talks to X.25 networks

- 33. Talks to IBM's AS/400 PC Support application
- 34. Talks to synchronous modems
- 35. Talks to SNA/SDLC environments
- 36. Talks to SAA compatible devices
- 37. Talks to IBM NetView
- 38. Talks to host as multiple logical units
- 39. Talks to IDEA Advanced Function Terminals
- 40. Talks to coax multiplexers
- 41. Talks to asynchronous multiplexers
- 42. Talks to concurrent gateway and downstream physical units
- 43. Talks to entire system through remote diagnostic capabilities
- 44. Talk to IDEA. 1-800-528-1400

#### IDEA

The intelligence to communicate better.

## The IDEA Courier team of terminal. It adapts to



It's mainframe. It's midrange.



Since both technology and business are always evolving, why limit yourself to equipment that can't? Introducing the 12000 Series of coax displays from IDEA.

The 12000 Series terminals feature a versatile modular design. A design that gives you the power to add functions and upgrade your terminals to keep pace with future requirements.

You can start with an entry-level display then, as your needs grow, upgrade to a high-function display simply by plugging in a new logic module.

You can also change from twinax to coax, or vice-versa. So if

your company has both IBM mainframes and AS/400s, you have the flexibility to work with either.

The benefits of modularity make the 12000 Series easy to service, too. Should an element fail, it can be replaced in the field within minutes, reducing downtime and maintenance costs.

As you've come to expect from IDEA Courier, the 12000 Series displays are rich in product features. You can choose either a 14" or 15" flat-faced, high-resolution screen, each with a removable tilt/swivel base and 104- or 122-key adjustable keyboard. In addition, the 15" model is available with a mono-

# Learn more about the winning products from the IDEA Courier team.

Please send me more information on	Host System(s) Installed:	Quantity
the following new IDEA products.	☐ IBM 370 class mainframe	
1	□ IBM AS/400	<u></u>
☐ IDEA Concert controller	☐ IBM System 3X	
☐ IDEA 12000 Series displays		
☐ IDEA Advanced Function Terminal		
Name	·	
Title		
Company		
Address		
City, State, Zip		
Phone		

		NO POSTAGE NECESSARY
		IF MAILED IN THE UNITED STATES
	BUSINESS REPLY FIRST CLASS PERMIT NO. 6162 PH Postage will be paid by addressee	
	IDEA Courier	
	Attn: Product Marketing/MS A16 P.O. Box 29039 Phoenix, AZ 85038-9039	
	Halaldallaadd	dalalalaladad
w .		

# announces a new species a changing environment.



It's financial. It's medical.



It's manufacturing. It's insurance.

chrome or color display.

For extra productivity, the 12000 Series terminals come with light pen support, auto keystroke storage, screen print buffers, set-up menus with pop-up windows, four screen sizes including 132-column and on-screen calculators with our exclusive data import and export capability.

All models feature parallel support for local printing with a display-attached printer, while high-function displays give you the option of host-addressable printing as well.

Because so many users depend on it, the 12000 Series

terminals include a three-year on-site warranty from IDEA

Servcom. Our own support group providing maintenance for all your computing equipment.

The 12000 Series from IDEA Courier. In the evolution of the terminal, there's never been anything like it. For more information call **1-800-528-1400**.

# IDEA

The intelligence to communicate better.

## Future fortunes hinge on present IS choices

BY GREGORY SCHMIDT

The financial services industry will be a whole new ball game within a few years as a shrinking field of players takes on more roles and diverse approaches to serving the customer. The relative positions of those that remain will be primarily determined by information systems choices being made today.

Until recently, the financial services industry was based on a strongly protected and institutionalized role as intermediary between buyers and sellers, lenders and borrowers, payers and providers and individual and collective risks. That role was predicated on exclusive possession of information that could be used to assess risks and reconcile the needs of parties on both sides of a financial transaction.

When computers made this information widely available, however, all the rules began to change. Deregulation and the appearance of a more sophisticated, demanding breed of consumer/investor combined to ex-

plode the quasi-monopolies of traditional financial institutions.

A whole new range of products and services appeared, many of which were the creations of companies never before seen in this arena.

The following are just a few of the major changes brought about by new information capabilities:

- Securitization. The practice of collecting large numbers of small loans with some common characteristics (trade credits, mortgages, credit-card loans, deposits) allowed the backing of securities that could be marketed and sold directly to savings customers.
- Disintermediation. Using credit ratings and investor networks, borrowers avoided traditional intermediary institutions and went directly to lenders with commercial paper and private bond placements.
- Rapid settlement. Improvements in processing technologies allowed the Federal Reserve to speed up check settlement dates dramatically so that banks' ability to earn interest on float all but disappeared.
- Mutual funds. The enhanced ability to manipulate a large portfolio led to the creation of large investment pools that focused on a variety of areas from stock indexes to foreign currency. The net effect was to make a range of sophisticated investments available to the small investor outside of the major markets.
- Self-insurance. Companies began finding that they could manage their own risks effectively. For example, most large firms now self-insure for health care.

Although financial services firms have seen traditional markets erode with the emergence of these nontraditional services, they have also been able to create additional sources of income using information technologies. Each year, they devise new types of credit — from variable-rate loans and equity lines of credit to checking account overdrafts and unlimited credit-card accounts.

Even more importantly, banks are finding that noninterest income — derived from fees, transaction charges, information and advice — is becoming the fastest growing item on their balance sheets. Over the next decade, information technologies will play an even more important part in defining the competitive position of financial institutions.

In fact, their greatest challenge will most likely be dealing with commoditization of information.

With information gathering and processing becoming both easier and more affordable,

Schmidt is a senior research fellow at the Institute for the Future in Menlo Park, Calif.

© Eastman Kodak Company, 1990



Kodak optical storage libraries can store more data, more quickly, in less space, at less cost than any other comparable system.

With the KODAK Automated Disk Library,
Model 560, you can store 4,000 2-drawer
file cabinets (up to 75 gigabytes of
information), in the space of one. It
accepts both WORM and erasable
drives, and fits under a table. For
centralized systems, the Kodak 6800
library stores more information than
16,000 4-drawer file cabinets (over a
terabyte of information), and lets
you find any file in 6.5 seconds. That
means better, quicker decision making
and happier customers.

Whether you are in banking, insurance, engineering or medicine, find out how Kodak optical storage libraries can be integrated to meet your requirements. For a complete package of product information and knowledgeable follow-up, call: 1800 445-6325. Ext. 993B. So much data, so little time.

# STORE THOUSANDS OF FILE CABINETS IN ONE.

KADAK

The new vision of Kodak



#### **EXECUTIVE REPORT**

developing value-added products will become more difficult and sustaining a long-term competitive advantage virtually impossible.

As a result, every financial institution will be forced to pick a strategy for action. Among the major choices are the following:

• The technological solution. National or major regional banks and thrifts, national insurance firms and large investment banks may want to develop large-scale systems that coordinate information on markets and customers, transaction records and settlements, risk and portfolio assessments and direct ties to their customers.

This will be an extremely expensive proposition because systems must continue to evolve as competitive products emerge. Only the largest firms will be able to take this route, but it will enable them to offer a full range of global services to major business clients and sophisticated consumers.

• Customer service. Other firms may be able to settle for standardized systems that are modular in nature, making it easy to add when new needs and

ITH information gathering and processing becoming both easier and more affordable, developing valueadded products will become more difficult and sustaining a longterm competitive advantage virtually impossible.

capabilities arise and to subtract when products become outdated or nonprofitable.

Institutions opting for this choice, however, will have to allocate substantial resources to improve their links with the customer by offering a personal banking officer, friendly insurance agent or daily phone contact with the investor.

In this strategy, the added value will be the communications technology that allows each organization to present relevant and current market choices to each of its customers.

• Market management. Still another choice will be to focus resources on gathering and assessing information about target markets.

A health insurer, for example, might concentrate on building an information inventory that allows it to negotiate provider costs in a managed care context, whereas a bank or a thrift might focus attention on a given type of commercial property development. A commercial paper deal-

er could establish its own credit ratings. The key to success for any institution choosing this approach would be fast, full and accurate market information.

• Niche identification. Finding a niche — such as a secondary market in municipal paper for small borrowers or a specialized reinsurance market — will be an option for the firm seeking to establish itself as a specialist

without the inordinate cost of running a comprehensive system

How realistic any of those options will be for a given financial institution will depend greatly on decisions that are being made right now about information systems and, more specifically, on how well informed those decisions are.

Future corporate strategy

will be determined by how effectively decision-makers can now answer questions such as the following: How much will it cost to establish and maintain a national debit card system? How quickly should an international investment portfolio respond to shifts in exchange rates? What are the most appropriate ways to reach middle-income households for the wide array of financial prod-

ucts and services?

Technology will always be a consideration in strategic planning. However, for at least the next few years, major strategy options for financial service firms will be almost completely dependent on answers about the costs of information systems and about how those systems can change relationships with consumers. •

# When It Came To Choosing Business Software, Campbell Really Used Its Noodle.



And what a smart choice it was. Only our *Financial*, *Human Resources* and *Environmental Management* software for the IBM AS/400 provides you with the mainframe functionality and PC ease-of-use necessary to let you get more work done.

That's why our midrange solutions are being chosen by more and more Fortune 1000 corporations.

Free White Paper Offer: For more information and a free copy of a white paper entitled, "Transparent Technology: Getting *Your* Work Done In the 90s," call 1-800-525-0490.

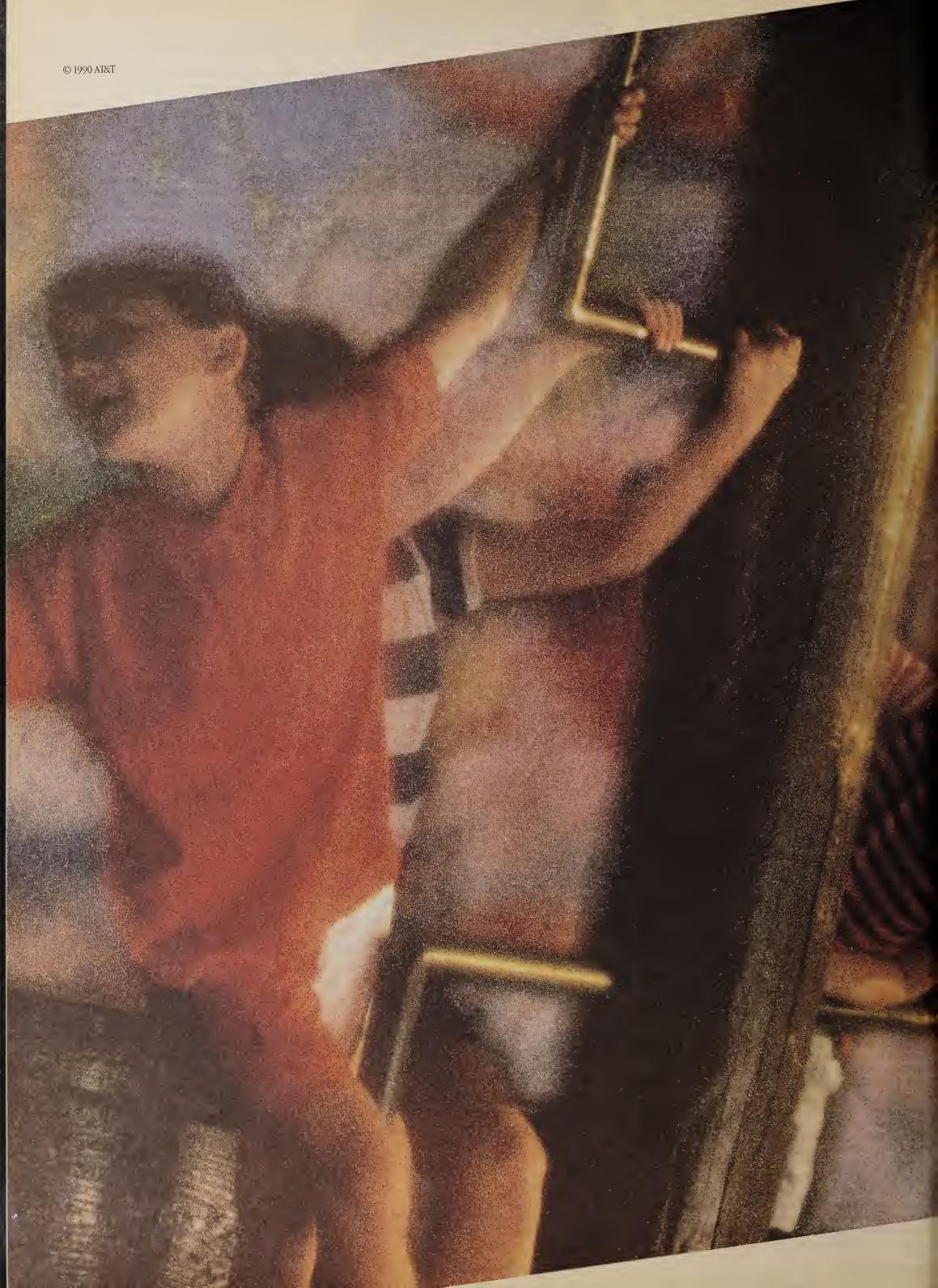
Software 2000

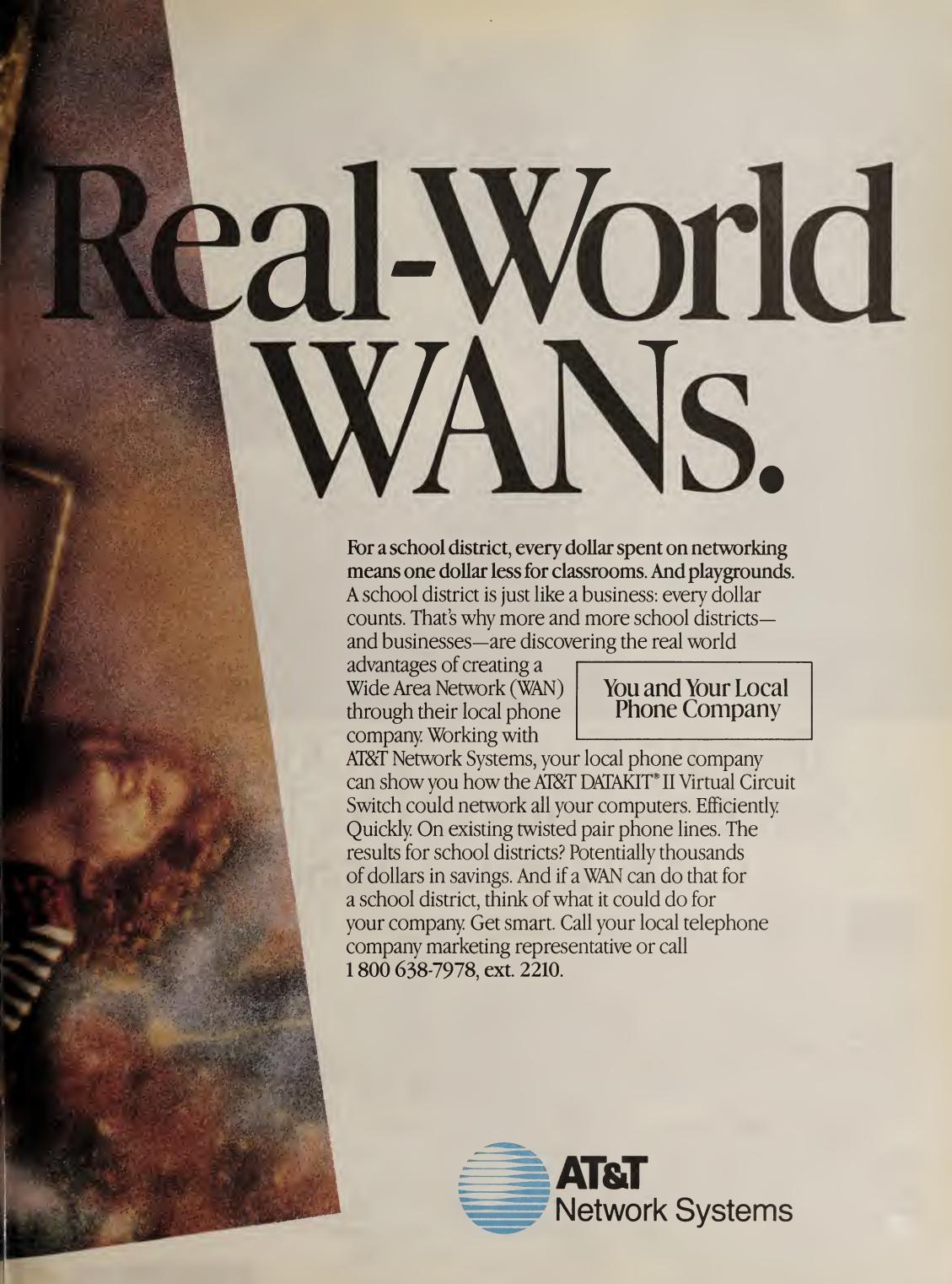
The Difference Is Expertise.

ATLANTA • BOSTON • CHICAGO • LOS ANGELES • LIMERICK • LONDON

IBM and AS/400 are registered trademarks of International Business Machines Corporation.

93







# Trusting Your CASE Operation To Someone Without Our Experience Could Be Just As Scary.

That's why you need Index Technology, the world's most experienced CASE provider. As the developers of the Excelerator® Series, we've helped tens of thousands of users around the world implement successful CASE solutions. And we've got the CASE histories to prove it.

Your CASE operation is too

What makes us different from the other CASE companies? Simple. At Index Technology, we don't just sell you a lot of flashy technology and

then disappear.

Instead, we give you everything you need to make your CASE operation succeed—including proven technology, adaptable products, and an array of support services rated the

best in the business. We show you critical to trust to an amateur. how to get results, and then we stay on call to make sure that you do.

Over the years, that totalsolution approach has earned us the trust of our customers. Including IBM, our biggest customer of all. In fact, IBM has so much confidence in us, it's purchasing an additional 2250 copies of our Excelerator products for its own use worldwide.

So it's no wonder that IBM is marketing our Excelerator Series as part of its own AD/Cycle™ offering. Or that IBM is relying on our advice in designing the Repository's information 02142, 1-800-777-8858. model. Which means our customers never have to worry about the longterm health of their CASE investment.

The fact is, we have so much faith in our CASE solution, we

encourage 60-day product trials. We're the only CASE vendor who does. We thinkthat says a lot about us—and even more about our competition.

But don't take our word for it. Get a second opinion. Call us for details on actual CASE histories, and find out what our customers have to say. Then try the same thing with our competitors.

We think you'll feel better with someone who's performed this operation before. And succeeded.

Index Technology Corporation, One Main Street, Cambridge, MA

Index Technology

There's No Substitute For Experience.

Excelerator is a registered trademark of Index Technology Corporation. IBM is a registered trademark and AD/Cycle is a trademark of International Business Machines Corporation

# IN DEPTH

# Move over, Unix: Here comes Mach!

This fast riser is not just for defense anymore

#### BY GARY H. ANTHES

t is an irony of the Unix wars that the winner may not be a version of Unix at

Propelled by factors that are likely to dominate computing in the 1990s, the industry is increasingly turning to Mach, a born-again, Unix-like operating system from the University of California at Berkeley that offers high portability, support for multiprocessing, robust security — and freedom from AT&T licensing requirements.

Mach has roots predating Unix, but in its modern guise, it is being developed by Carnegie Mellon University using the University of California at Berkeley's Unix 4.2 version of Unix as a starting point.

Mach is funded largely by the Pentagon's Defense Advanced Research Projects Agency. DARPA wants an operating system that is highly portable, scalable for use in aggressively parallel supercomputers and able to evolve into a highly secure system — just the things needed to support advanced weapons and other military projects.

While Mach may still be considered by some to be a research project, it has turned into the operating system of choice at Carnegie Mellon. According to Richard Rashid, Mach project director at the university, Mach is the primary operating system on some 550 machines there, including Digital Equipment Corp. VAXs, Sun Microsystems, Inc. workstations, Intel Corp. 80386-based personal computers and Apple Computer, Inc. Macintosh IIs.

Mach is not just for defense anymore. So far, Carnegie Mellon has shipped research versions of Mach to 157 corporations and 91 universities.

Next, Inc. and Encore Computer Corp., among others, sell computers running Mach. Mt. Xinu, a small Berkeley, Calif.-based company, sells supported versions of Mach for Sun workstations, DEC VAXs and IBM RT workstations. Mt. Xinu also has versions in the works for 386-based PCs, Macintosh IIs,

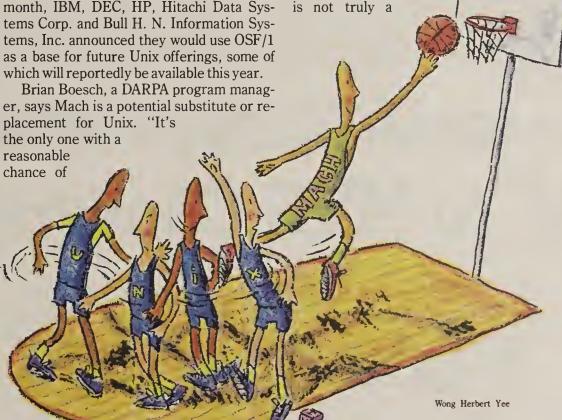
Mips Computer Systems, Inc. reduced instruction set computing microprocessors, Hewlett-Packard Co. 9000 series and oth-

Carnegie Mellon has ported Mach to a number of other platforms, including a 30processor system from Sequent Computer Systems, Inc. in Beaverton, Ore., several VAX models, IBM's 370 and computers based on Motorola, Inc.'s 88000 and 68020 processors, as well as Intel's I860 and 386 processors.

Meanwhile, Carnegie Mellon and DARPA are working with another small vendor and the National Security Agency to develop a highly secure version of Mach. Some believe that such a version could have great commercial appeal, especially for banks.

#### **Propelled forward**

In the biggest boost for Mach so far, the 170member Open Software Foundation (OSF) chose the operating system in November as the cornerstone for OSF/1, its would-be industry standard operating system. Last month, IBM, DEC, HP, Hitachi Data Systems Corp. and Bull H. N. Information Systems, Inc. announced they would use OSF/1 as a base for future Unix offerings, some of which will reportedly be available this year.



offering high trust, and no other Unix sup-

ports multiprocessing. When push comes to

shove, Mach or Mach concepts will crowd

systems software at Next. The company

wanted a more advanced environment than

was offered by MS-DOS, he says — specifi-

cally, one offering multitasking, virtual mem-

and other Unix variations were not the an-

swer for Next; they had evolved in a time-

sharing world and carried too much excess baggage to be appropriate for the desktop,

Tevanian says. "Deep down inside, people

know they need Unix, but there are prob-

The power of Unix without the baggage

97

lems they are afraid of," he adds.

was attractive, Tevanian

says, as was Mach's

ability to support gra-

Although Mach

phics animation.

AT&T's Unix System V, Berkeley's Unix

"It was clear we needed Unix-like functionality," says Avadis Tevanian, manager of

out Unix," he says.

ory and Unix tools.

Anthes is Computerworld's Washington, D.C., correspondent.

- In testing at more than 200 organizations
  - Endorsed by OSF, Next and others
    - 'Unix without the baggage'

real-time operating system, the Mach kernel is ideally suited for embedded and real-time use, says Alan Tobey, a marketing manager at Mt. Xinu.

The company hopes to work with several firms to adapt Mach for applications such as high-speed switching and communications controllers.

Carnegie Mellon's goal — only partly achieved so far — is to build a Unix-free Mach kernel, a set of "primitives" that control basic hardware functions such as

cally replacing that with its own software.

The Mach Release 3.0 kernel will be entirely free of Berkeley and AT&T code, Boesch says, and a later release — dubbed 3.X — will have purged the proprietary code from the Mach servers and libraries as well. According to Boesch, this will result in a Unix-like operating system free of any requirement for an AT&T or a Berkeley license.

OSF took a version of Mach from Encore — which had already added features

Unix can be taken to the level of trust that TMach will offer because the existing Unix kernel is enormously complex, says Stephen Walker, president of Trusted Information.

TMach is intended to win certification by the National Security Agency at a B3 level of trust. This is the next-to-highest rating on NSA's scale, which ranges from D, offering minimal protection, to A1, providing extremely rigorous safeguards.

As user concerns mount over breaches in computer security, TMach, like Mach, seems likely to move beyond the confines of the defense and intelligence communities. "As soon as someone can deliver a DBMS for a B3 system, banks will want it," Goldstein says.

Mach concepts may eventually permeate Unix. A source close to AT&T says that some of the company's Unix developers use workstations displaying two active windows — one holding Unix System V, Release 4 and the other Mach. Whether Mach code or just Mach concepts flow from one window to the other is not clear, the source says.

#### **Mach history** Tops-10 DEC The evolution of the Mach operating system Umax Encore Unix Unix Sys. V CTSS MIT 1964 Mutics Bell Labs MIT, Bell 1969 Unicos Cray Research Mach OSF/1 Next, Encore HP/UX Sequent OS SunOS Sun Microsystems Sequent

CW Chart: John York

virtual memory management, message passing and processor management. Layered above the kernel are programs called servers, such as file control and networking.

By isolating the machine-dependent portions of code within the kernel, hardware-independent versions of Unix — or another operating system such as OS/2 or MVS — can be layered on top. A single Mach kernel could even support multiple native-mode operating systems running simultaneously.

Today's version of Mach, Release 2.5, still contains a generous amount of Berkeley's Unix 4.2 code and some AT&T Unix System V code as well. However, Carnegie Mellon is currently at work systemati-

for parallel processing to Mach 2.5 — and is now adding its own enhancements at the rate of \$40 million per year. OSF/1 is scheduled for general release late this year.

Ira Goldstein, research vice-president at Cambridge, Mass.-based OSF says OSF/1 will require payment of an AT&T license fee, while OSF/2, due out late in 1992, may not.

OSF/2 will be built around TMach, now being developed by Trusted Information Systems, Inc. in Glenwood, Md., under a contract with DARPA. TMach will be a highly secure version of Mach based on an early version of the Unix-free Mach kernel

As a practical matter, no version of

#### **Ours** is better

Not surprisingly, OSF touts the benefits of Berkeley's Unix 4.2-based Mach at the expense of archrival Unix International, which wants to establish its own industry standard based on AT&T's Unix System V.

"We see OSF as a beneficiary of BSD [Unix 4.2], not a competitor. But we think multiprocessing plus B3 [security] will lead people to choose OSF over System V," Goldstein says.

"That's poppycock," says David Sandel, marketing vice-president at Unix International, the 150-member consortium that defines Unix System V, Release 4 requirements for AT&T implementation.

Sandel says Unix System V, Release 4 will be certifiable for a B2 level of trust — just below that of TMach and OSF/2 — by late this year or early 1991.

He also says Unix System V, Release 4 will offer parallel multiprocessing for shared-memory architectures one year

after that. Sandel adds that Unix International has evaluated Mach and may incorporate some Mach concepts in Unix System V, Release 4.

Addressing the charge that Mach already has multiprocessing capabilities while Unix International has only a plan, Sandel counters: "Unix System V is a commercial operating system with many years of testing behind it. Mach is a research project — that's a major difference."

According to Next's Tevanian, Mach does not compete with Unix but is rather a base to build Unix on. For example, he says, Mach's file system today is the one used in Berkeley's Unix 4.2, but it will be rewritten and greatly improved by Carnegie Mellon.

Tevanian says, "Mach in a sense will save Unix, causing it to evolve in a positive way. Whether you call it Unix or Mach, who cares?" •

# How Mach works

o support multiprocessing, Mach uses the concepts of "tasks," or collections of systems resources, and "threads," meaning the basic units of computation. Multiple threads can execute simultaneously within a task, which contains a single virtual address space.

Tasks share results by passing messages through ports or by sharing memory. Mach was designed to send messages to a process on another computer as easily as to another task on the same machine.

Mach employs a flexible approach to memory management in multiprocessor systems that allows the use of shared memory or distributed memory. Mach can also accommodate hybrid systems in which some memory is shared and some is local to specific processors. This allows Mach to be used in shared-memory multiprocessors, such as DEC's VAX; distributed-memory machines, such as BBN Advanced Computers, Inc.'s Butterfly; and in computer networks.

Virtual-memory management is split into machine-dependent and machine-independent portions. which aids portability. According to Richard Rashid, a professor at Carnegie Mellon University who leads the Mach project, the flexibility and power of Mach do not impose a performance penalty. The University of California at Berkeley's Unix 4.3 kernel, which Rashid refers to as a "dumping ground" for every conceivable feature, has been greatly streamlined for Mach. In addition, Mach replaces many of Unix's physical inputs and outputs with inmemory accesses.

For the same machine running the same Unix-based applications, Mach typically shows a 10% to 25% performance advantage over Unix 4.3, Rashid says.

GARY H. ANTHES

# Let IBM Help Pay For Your VSE to MVS Conversion

Call **1-800-344-1273** 

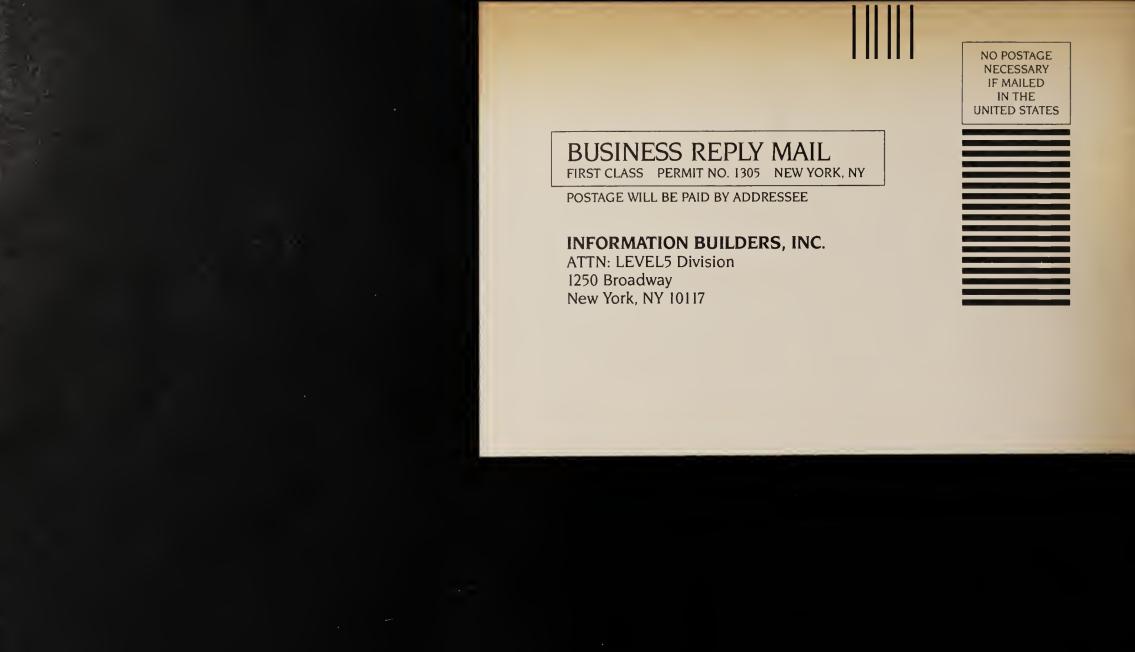
for complete details.



981 Route 22, Bridgewater, New Jersey 08807

# LEARN WHAT LEVELS FOR FOCUS CAN DO FOR YOU.

<ul> <li>Yes, I want more information about LEVEL5 for FOCUS, the only 4GL integrated with an Expert System.</li> <li>□ Please have a representative call me.</li> </ul>	☐ I am currently a FOCUS user.  Hardware  OP SYS ☐ I am currently a LEVEL5™ user.  Hardware  OP SYS
NAME	Please specify your job title/function:
	$\square$ Al Specialist $\square$ Knowledge Engineer
TITLE/DEPT.	☐ Consultant ☐ Corporate Purchaser
COMPANY	☐ DP/MIS Professional ☐ Government Purchaser
	☐ Other (please specify)
ADDRESS	© 1990 Information Builders, Inc. LEVEL5 is a trademark of Information Builders, Inc.
CITY STATE ZIP	Cail 212-736-4433
TELEPHONE	Ext 3700



# BRING AN EXPERTINTO FOCUS.



# INTRODUCING LEVELS FOR FOCUS. THE ONLY 4GL INTEGRATED WITH AN EXPERT SYSTEM.

Now you can meet your company's ever-growing demands for better information with the only proven 4GL to integrate the power of expert systems technology. We call it LEVEL5 for FOCUS. You'll call it The Expert 4GL.

LEVEL5™ for FOCUS is a complete application-development environment that combines 4GL tools and data management with a fully optimized rule-based inferencing system. Now you can create a new generation of FOCUS applications that capture and apply knowledge. The rules and regulations, policies and procedures on which every company relies. You can turn simple decision support into advanced decision management.

FOCUS is proven technology for accessing, manipulating, and storing data. For the first time,

strategic knowledge can be consulted from any of these critical functions from any point in your application. And since you can do this from many applications, you can better address consistency and maintenance across your organization.

It's from Information Builders, so you can apply these unique capabilities to data in every file and database in your IBM or DEC data center including DB2, SQL/DS, IMS, Rdb, DBMS, and RMS.

Only Information Builders provides seemless integration between the most widely used 4GL and the fastest growing expert system to give you The Expert 4GL. Now give your applications the power to deliver the best information. Contact Information Builders, Inc., 1250 Broadway, New York, NY 10001, or call 212-736-4433 ext. 3700.



INFORMATION BUILDERS, INC., 1250 BROADWAY, NEW YORK, NY 10001

212-736-4433 Ext. 3700

# Pick one thing you want in transaction processing:

- 1 Fault-tolerant
- 2 Distributed
- 3 Integrated

# Now bick three.

MicroVAX™ systems, through our VAX 6000 midrange systems, to our largest VAX 9000 mainframe, or as part of a VAX cluster system. So now, you can put fault tolerance only where you need it.

It's distributed.

For distributing transactions, applications and databases anywhere in the world, DECtp systems now offer DECdtm™ software with two-phase commit. A capability that allows one single transaction to access multiple databases on a network with absolute integrity.

With DECdtm software, you can put your data and computers wherever you need them, yet access and update them from anywhere in the world.

It's integrated.

And DECtp systems are still based on the architecture that continues to tear down the barriers to the integrated business environment. The VAX/VMS architecture.

VAX/VMS lets you integrate your tp applications with decision support or artificial intelligence. Or run your tp application alongside your accounting, running in batch. And develop your tp applications in the same environment you'll be running them in.

And with Digital's Network Application Support (NAS), you can even integrate a DECtp system with the applications you are running on other vendors' PCs and mainframes.

It's everything you need.

With Digital, as always, you can call on 41,000 professionals working out of 450 service locations in 64 countries to support you wherever you do business, 24 hours a day, seven days a week.

And for your new tp applications, we provide planning, design, implementation and management services ranging from education to on-site consulting. Ten new expertise centers and service alliances devoted exclusively to tp mean you receive the most responsive service ever, all around the globe.

To find out what a DECtp solution can do for a business like yours, write to Digital Equipment Corporation, 129 Parker Street, K29, Maynard, MA 01754-2198. Or call your local Digital sales office.

Digital

has it now.

Once, you had to make some hard choices in transaction processing.

But now there's an easier choice. Just choose the next generation of DECtp™ products and services from Digital. And choose to have it all.

#### It's fault tolerant.

These days, information systems don't just support your business. They <u>are</u> your business. And without them, you're out of business.

And for all those times, Digital, the leader in high availability with over 15,000 VAX cluster™ systems installed, now offers the first system to bring fault tolerance to a mainstream architecture, the innovative VAXft™ 3000 series.

The VAXft 3000 system protects your business from many different kinds of disruptions, outages and failures. Without loss of data or work in progress, or ever interrupting your users.

But best of all, the VAXft system isn't only fault tolerant. It's a VAX.™ When you run any of the existing 6500 VAX/VMS™ applications on a VAXft system, they become fault tolerant without rewriting a single line of code.

And the VAXft series fits right into a network of other VAX computers, from our smallest

Oigital Equipment Corporation, 1990. The DIGITAL logo, Digital has it now, DECtp, VAXcluster, VAX, VAXft, VAX/VMS, DECdtm and MicroVAX are trademarks of Digital Equipment Corporation.

# BKG BORROW SIKAL SUBSCRIBE

There are four ways to get the latest news in the IS industry hot off the pages of *Computerworld*.

We highly recommend you subscribe. And save the risk of personal embarrassment or possible arrest.

Order now and you'll receive 51 issues packed cover to cover with the most up-to-the-minute information on topics ranging from products and people to trends and technology.

Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

According to a study conducted by the Adams Company, *Computerworld* is the best-read publication in the industry. And with good reason. It's timely. It's topical. And it's thorough.

So don't get stranded on the bottom of your company's routing slip, while everyone else is using *Computerworld* to climb the corporate ladder.

Use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld* — without begging, borrowing, or stealing.



The Newsweekly of Information Systems Management

# COMPUTER INDUSTRY

# NATIONAL

**Return of the Atari kid** Commodore International Ltd. put together a new tag team aimed at developing and marketing interactive, Amiga-based consumer products and went straight to the well to find the man to head it: Nolan K. Bushnell, the home computer products pioneer whose resume includes the founding of Atari, Inc. and the creation of the first video game system. Bushnell's official — and freshly minted — title at Commodore will be general manager, consumer interactive products, according to

#### **Not 'the Toronto Operations**?

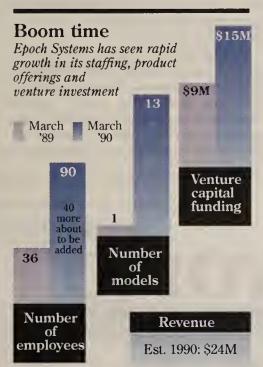
the company.

Unix player The Santa Cruz Operation is about to acquire 100% of Torontobased HCR Corp., hailed as Canada's leading Unix supplier, the companies jointly announced last week. The privately held mates-to-be declined to reveal financial terms of the deal beyond stating that it would take place as a "share swap with a multimillion-dollar value." The companies said that when everything is done — pending the final approval of the company's shareholders — HCR will run as an independent subsidiary known as SCO Canada, Inc.

#### **Migrating East**

Technology and accounting consultancy Deloitte & Touche has joined forces with Migration Technologies, Inc. in Camarillo, Calif., to provide technology migration services to companies that are moving from one computer vendor to another. Migration Technologies already markets Migration Project Life Cycle, a software tool for planning and executing the transition from one computer platform to another. Financial details of the partnership — which the companies said will be headquartered in New York — have still not been disclosed.

# Twin Peaks: Looking good so far



#### Up-and-comer Epoch taking off

BY MARYFRAN JOHNSON

f Christopher Robert ever feels like gazing into his past, the president and chief executive officer of Epoch Systems, Inc. need only glance out his office window.

Down a sloping, barren hill from Epoch's new Westboro, Mass., headquarters sits Data General Corp., which served as a career breeding ground for Robert and several other top executives at this fast-growing network storage vendor.

Yet no one at Epoch seems to be looking backward these days.

"It's our job to run faster than anyone else," Robert said. "The one thing a company can do wrong is look backward to figure what the other guy is

The 4-year-old firm that appeared to be an up-and-comer last year [CW, March 6, 1989] has grown apace since then. It is currently expanding its 90person staff by 40 new employees and counting on 1989 sales of \$7.7 million to triple this year. Its first foray into Japanese and British markets last year shifted 20% of Epoch's annual sales

Unlike so many of its Boston-area high-tech neighbors, now suffering slumping fortunes, Epoch is surging ahead with a leading-edge product and free run of its own specialized niche in optical and magnetic disk storage.

John Dunkle, a vice-president at Continued on page 105

#### Network General justifies hype

CW Chart: John York

BY ELISABETH HORWITT CW STAFF

etwork General Corp.'s story reads like a classic Horatio Alger tale. Five years ago, plucky Harry Saal, undaunted by the financial flounderings of his first venture, Nestar Systems, Inc., struck gold with his second by anticipating an explosion in demand for more effective local-area network troubleshooting tools.

Today, Menlo Park, Calif.-based Network General is still riding the crest of that explosion. Fourteen months after the company made what many analysts called the network industry's hottest public offering of the year, its stock has tripled in value.

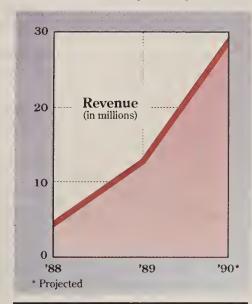
Late last month, Network General, still riding on the rewards of its flagship Sniffer LAN protocol diagnostic system, reported record revenue of \$8.8 million for its fiscal-year 1990 fourth quarter — a 119% increase over the same quarter last year. The company's revenue doubled in 1989, and it expects to double it again this year to \$29 million, Saal said.

Nor is saturation of Sniffer's market in sight. "There are still thousands of LANs with no tools," Saal said. The need for tools to pinpoint LAN trouble spots, on the other hand, continues unabated. The number of LAN installations is expected to grow 40% per year between 1989 and 1993, a recent report by Arthur D. Little, Inc. said.

Continued on page 105

#### On a roll

Network General has more than doubled revenue in each of the past two years



Source: Network General Corp.

### One roof over competitors' heads?

Novell buys stake in Gupta Technologies, possibly setting the stage for a family feud

BY CHARLES VON SIMSON **CW STAFF** 

xtending the dense web of alliances in the database server community, Menlo Park, Calif.-based Gupta Technologies, Inc. announced earlier this month that it had sold a 20% share of the company to Novell, Inc. for an undisclosed sum.

Executives of both companies said that the deal simply cements Gupta's commitment to develop database products for Novell's Netware network software. However, if the proposed merger of Novell and Lotus Development Corp. is consummated, it will give the merged company ownership in two competing database companies.

Lotus owns a 15% share of Sybase,

Inc. — the developer, along with Mi- ed, the company would simply make crosoft Corp., of the SQL Server database server product that competes directly with Gupta's SQL Base database server. If the merger between Lotus and Novell is finalized as expected, the proposed Gupta deal could set up a competitive environment rife with potential conflict of interest in the database management system market.

Umang Gupta, president and chief executive officer of Gupta Technologies, was adamant that the deal was struck with Novell and not with the firm resulting from the Novell/Lotus merger. "It gives us a technical endorsement and financial backing from Novell," he said. "It is an agreement between us and Novell and not Lotus."

A spokesman for Novell said that until the merger with Lotus is complet-

the best decisions it could as a standalone company and that Lotus was in no way involved in the negotiations with Gupta.

Umang Gupta acknowledged the potential for conflict. "Someone will have to figure out whose side everyone else is on," he said. "I am frankly not sure how this will all work out."

A Gupta source close to the deal said that the agreement between Lotus and Novell came after the Novell agreement with Gupta and complicated the process. The source maintained, however, that both sides had the option to back out and chose not to. "For now, we really see it as a formal endorsement of our commitment to Netware," the source said. "The rest will have to wait."

### Gephardt decries U.S. lack of industrial policy

BY PETER BARTOLIK
CW STAFF

BOSTON — House Majority Leader Richard Gephardt (D-Mo.) last week called on high-tech executives to become involved in a "giant fight" brewing in Washington, D.C., over development of a national industrial policy.

In a speech to a meeting of the board of directors of the American Electronics Association, Gephardt said an industrial policy is one of the three initiatives needed from government to ensure that U.S. industry is competitive with Japan and a unified Europe at the end of this decade.

The other linchpins of Gephardt's "High Technology Competitive Agenda for the Future" are resolution of the U.S. budget deficit and changing the nation's education system to eliminate the escalating high school dropout rate.

While offering few specifics, the unsuccessful candidate for the 1988 Democratic presidential nomination painted development of an industrial policy as the cornerstone for international competitiveness.

Although "'industrial policy' are the words no one wants to utter," Gephardt said, "if we don't get one pretty soon, we are likely not to have any industries left

that we care about."

The recent ouster of Craig Fields from the position of director of the Defense Advanced Research Projects Agency, or DARPA, [CW, April 30], Gephardt said, "was not because [Fields] didn't do the job right . . . it was because of ideological disagreement within the White House on what he was trying to do."

DARPA has long been involved in nurturing fledgling technologies considered crucial to advanced defense systems. Fields had steered the agency toward "dual-use technologies" that had commercial as well as military potential; he had sponsored the Sematech semiconduc-

tor consortium, high-definition television projects and made an unprecedented direct investment last month in a developer of gallium arsenide circuits.

Gephardt invited the electronics executives to become involved in an upcoming battle over a bill crafted by Sen. John Glenn (D-Ohio) to create a "civilian DARPA" — essentially a nonmilitary agency designed to seed technology startups in commercially strategic areas. The bill would overhaul the Commerce Department and seek to promote exports.

Decrying Bush administration officials who "do not believe there is any difference between semiconductor chips and potato chips," Gephardt argued that the U.S. has in the past crafted industrial policies that paid off. "We've had an industrial policy in agriculture for 100 years, and it's the reason we have the lowest prices and best quality product in the world," he said.

More immediate, however, is the "budget summit" President Bush has proposed to hold with Congress in a bid to resolve the staggering budget deficit.

While saying he hoped such a summit will be successful, Gephardt offered little optimism. "I'm worried that the well has been poisoned by the political back-andforth on the tax issues," he said, noting that just days after Bush indicated a willingness to participate in the budget summit, Republican leaders were coming out of the White House saying particular tax issues are not open for debate.

With 85% of the federal budget split between interest payments on the national debt, defense spending and social security outlays, "to think we can do something without revenue is not realistic," Gephardt said.

On the issue of a capital-gains tax break — an issue dear to many of the executives Gephardt was addressing last week — the democratic congressman held out a very tenuous offer, hinting that it might be considered if the tax rate for high-income taxpayers is raised to at least match that of middle-income earners.

# Computerworld EDITORIAL REPRINTS

#### Reprints from *Computerworld* provide a valuable marketing/sales tool for your company!

Editorial articles are available as reprints and can be ordered in various quantities, and customized to include your company logo and sales offices. Whether you wish to have reprints of an article written specifically about your company or a subject of general interest, these reprints \* can be a great resource for use in:

- Promotional/P.R. materials
- Internal meetings
- Company seminars
- \* Produced in a minimum quantities of 500 for black-and-white and two color reprints; 1,000 for four-color reprints.

For complete information on ordering reprints contact:

Sharon Bryant
Reprints Department
Computerworld
375 Cochituate Road
Framingham, MA 01701-9171
Tel. 508-879-0700



ECTTIVE REPORT TRAINS
ECTTIVE REPORT NEWS
ODICT SPOTLIGHT NEWS
ODICT SPOTLIGHT NEWS
ODICT SPOTLIGHT
NETWORKING
CINT REPORT NETWORKING

#### COMPUTERWORLD

The newspaper for information systems management

EXECUTIVE CORNER

# Telebit founder honored by IEEE



Modem supplier Telebit Corp. recently honored its founder, packet-switching pioneer Paul Baran, by electing him chairman. In October, he is scheduled to

receive the Institute of Electrical and Electronics Engineers' 1990 Alexander Graham Bell Medal for "exceptional contributions to the advancement of communications sciences and engineering."

Northern Telecom Ltd. Chief Executive Officer Paul G. Stern is now the \$6.1 billion telecommunications company's chairman. The former Unisys Corp. president, who took over the helm of Northern Telecom in March, 1989, replaces Edmund B. Fitzgerald, who will remain a member of the board.

Coopers & Lybrand has appointed Dean P. Bouloukos as partner in charge of the information technology practice in its Chicago office. Bouloukos was previously a partner at Ernst & Young.



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price.

First Name	MI	Last Name	
Title		Company	
Address			
City		State	Zıp
Address Shown:	☐ Home ☐ Business		Basic Rate: \$48 per year

\* U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

BUSINESS/INDUSTRY (Circle one)

Manufacturer (other than computer)
 Finance/Insurance/Reel Estate
 Medicine/Law/Education

40. Wholesale/Retail/Trade

Business Service (except DP)
Government - State/Federal/Local
Communications Systems/Public Utilities/ Transportation

70. Mining/Construction/Petroleum/Refining/Agric. 80. Manufacturer of Computers, Computer-Related Systems or Peripherals

System Integrators, WARs, Computer Service
 Bureaus, Software Planning & Consulting Services
 Computer/Peripheral Dealer/Distr./Retailer

User: Other 95. Vendor: Other\_

(Please specify)

TITLE/FUNCTION (Circle one) IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/Asst VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Suprv. of Programming, Software Dev
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students

90. Others

(Please specify)

COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.

Mainframes/Superminis Minicomputers/Small Business Computers Microcomputers/Desktops

Communications Systems

Local Area Networks
No Computer Involvement

E4020-X



YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$44.00\* per year — a savings of 57% off the single copy price.

First Name	MI	Last Name			
Title		Company			
Address		<u> </u>			
City	<u> </u>	State	Zip		
Address Chause Giller	G.B. valances		0.0	aia Datas 649 par upar	

\* U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.



BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)

Finance/Insurance/Real Estate

Medicine/Law/Education Wholesale/Retail/Trade Business Service (except DP)

Government - State/Federal/Local

Communications Systems/Public Utilities/

70. Mining/Construction/Petroleum/Refining/Agric. 80. Manufacturer of Computers, Computer-Related

(Please specify)

TITLE/FUNCTION (Circle one) IS/MIS/DP MANAGEMENT

19. Chief Information Officer/Vice President/Asst. VP

Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
 Dir./Mgr. MIS Services, Information Center
 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
 Dir./Mgr. Sys. Development, Sys. Architecture
 Mgrs., Suprv. of Programming, Software Dev.
 Programmers, Software Developers
 Sys. Integrators/VARs/Consulting Mgt.

OTHER COMPANY MANAGEMENT

President, Owner/Partner, General Mgr Vice President, Asst. VP

Treasurer, Controller, Financial Office

41. Engineering, Scientific, R&D, Tech. Mgt. 51. Sales & Mktg. Management OTHER PROFESSIONALS

Medical, Legal, Accounting Mgt.
 Educator, Journalists, Librarians, Students

(Please specify)

COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as a user, vendor, or consultant.

Mainframes/Superminis Minicomputers/Small Business Computers

Microcomputers/Desktops

Communications Systems

Local Area Networks
No Computer Involvement

E4020-X

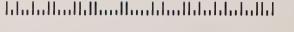
#### **BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

## COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES





#### **BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

#### COMPUTERWORLD

P.O. Box 2044 Marion, Ohio 43306-2144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



## Epoch FROM PAGE 103

Workgroup Technologies in Hampton, N.H., said Epoch has kept this storage niche to itself because no other company offers an optical disc server as a standalone component. Major systems vendors such as Digital Equipment Corp. are promoting optical technology only as part of much larger systems.

"I think they have a lot of blue sky ahead of them," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass. "There's nobody who comes close to offering the price per megabyte and the performance level Epoch does."

Bretzmann pointed out, however, that since the Epoch-1 Infinite Storage Server began shipping only 16 months ago, the company "hasn't had that much time or that many products to do too many things wrong."

Designed to satisfy the everexpanding storage needs of Unix-based workstation users, Epoch's data servers provide fast on-line access to high-capacity disk storage over an Ethernet network. The bulk of its 60 accounts are at firms with Sun Microsystems, Inc. installations of more than 30 workstations.

Customers said the beauty of the system, with its embedded software automatically managing disk space, is its invisibility. All data appears to be on-line, and storage capacity seems unlimited.

One premier customer is GTE Directories Corp. in Dallas/Fort Worth. The telephone directory publisher, which distributes more than 1,100 directories worldwide, installed a 30G-byte Epoch-1 in January 1989 to clear up the storage bottleneck caused by the hundreds of thousands of display ads created each year on its network of 100 Sun-3 workstations.

Last summer, GTE added four more Epoch servers for its regional centers in Florida, Washington state and California. "We've reduced the time needed to retrieve a data file from hours or days to 15 or 20 seconds," said Bob Ohnstad, production

staff director at GTE.

Epoch's hierarchical storage system, which recently expanded beyond Unix workstations to offer compatibility with DEC's VAX/VMS, combines the speed of magnetic disk drives with the voluminous capacity of erasable optical discs stacked in a jukebox, according to the company.

Epoch's biggest challenge now will be "filtering its technology down" to more traditional commercial clients in the Fortune 100, Dunkle said.

Epoch stands apart from the crowd of disk drive vendors as a

cheaper alternative to a spreading farm of Winchester disks. Its \$4 to \$5 cost per megabyte contrasts starkly with the \$45-permegabyte cost of storage on a Sun-4 workstation, for example.

The company now offers 13 different models in a range of subsystems that are priced from

Stella Johnson

Epoch's Robert researched the firm

\$61,000 to \$694,000, including entry-level systems, 5¼-in. rewritable optical disc servers and 5¼- and 12-in. write-once readmany optical disc servers.

"The other thing driving demand [for Epoch's offerings] is the big push to get rid of paper," Robert said. "I really believe the file cabinet in the corner will die with the right technology, and that technology is optical storage."

With an eye toward sharpening the firm's sales and marketing organization, Epoch cofounder and DG veteran Kenneth Holberger four months ago left his CEO post to become chairman of the board.

New CEO Robert's management background includes field operations at Lexidata Corp., plus a decade of product marketing and sales at DG. In 1983, he co-founded Corporate Software, Inc. in Westwood, Mass., and

helped build it into a \$134 million public company.

"I checked this company out very carefully, and I liked the visionary strategies," Robert said. "I also liked the fact that customers were saying the product was even better than they expected."

#### **Net General**

FROM PAGE 103

"The need for [LAN diagnostic products] is growing partly because people are becoming more LAN-conscious but more because of the increasing LAN complexities," said Richard Segal, a technical adviser at Aetna Life and Casualty Co. and a Sniffer user. "People are mixing and matching Ethernet and Token-Ring, one person's LAN software, another's network driver, and the more stuff [from different vendors you put in the box, the more fingers start pointing,' Segal said. "Sniffer, the old wolfhound," can discover the guilty

While both Hewlett-Packard Co. and Excelan, Inc. — now a subsidiary of Novell, Inc., which itself was recently acquired by Lotus Development Corp. — had introduced LAN diagnostic products prior to Network General, Sniffer rapidly established itself as a "Cadillac in the business" because of its rich array of features and broad support of networking protocols, said Alice Bradie, a principal at Hambrecht & Quist, Inc.

Saal determined that Sniffer would be protocol-independent—a lesson learned from Nestar, which based its LANs on Arcnet and then watched Ethernet and token-ring take off.

Indeed, independence has been a keynote of Network General's success. While the firm has completed several OEM deals in which vendors such as Data General Corp. resell Sniffer to their customers, Network General has remained aloof from the recent rash of acquisitions in the

networking industry.

Mergers such as 3Com Corp.'s acquisition of Bridge Communications and Novell's acquisition of Network General competitor Excelan have resulted in "a lot of good people leaving," Saal said. "If that's the industry trend, we'll go upstream."

Network General could be at a turning point right now as a result of its recent first major introduction since Sniffer — a lowend, easy-to-use LAN monitoring tool called Watchdog, Saal indicated. While Sniffer is geared to the more sophisticated analysis needs of the upper 5% to 10% of large corporations, Watchdog potentially addresses the much broader market of small to medium-size LAN installations that cannot afford to employ the network expertise needed to operate Sniffer, he added.

Watchdog will actually become an intrinsic part of the next Sniffer release, Saal said. However, the low-end system's appeal may be limited to new customers, given that Sniffer users may not see much need for Watchdog's simpler monitoring capabilities.

Paul Hastings Janofsky & Walker, for instance, has been very happy with Sniffer's "ability to do both general and indepth analysis" as well as diagnose problems across a system that combines Novell's Netware, Xerox Network Systems and X.25, said Steve Hauberg, the Los Angeles law firm's data processing manager.

However, Paul Hastings sees no need to install Watchdog because "you give people the most complete tool you can give them," Hauberg said.

#### 3Com hones in on Asian LAN market

BY JIM NASH CW STAFF

SANTA CLARA, Calif. — 3Com Corp. officials are moving aggressively to capitalize on a local-area network market they plan to dominate: Asia.

"Asia is an absolutely humongous marketplace," said Eric Benhamou, president of 3Com. It is a marketplace Benhamou said he intends to command.

"We have landed," he said. "Our Far Eastern operations are in full expansion."

Benhamou said he foresees Japanese revenue reaching 10% of all company revenue by the mid-1990s. Half of 3Com's current business in Japan consists of terminal-to-host LANs, said Robert Freeman, 3Com's manager in Japan.

#### **Asian connections**

Benhamou explained that 3Com, which has done business in Asia since 1983, opened a regional office in Taipei, Taiwan, this month and will follow that up with another office next month in Singapore. 3Com already has a regional office established in Hong Kong.

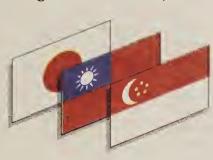
3Com's Asian initiative is drawing skepticism from some quarters. Nina Burns, a principal at Menlo Park, Calif., market research firm Network Management Solutions, said 3Com is "running with the pack" as it races to Asia. The company's success, Burns said, more likely will come from its products and interoperability overtures than from geographical moves.

For 3Com, which has all but

surrendered the domestic market for network operating systems to Novell, Inc., turning to Asia presents a second chance to battle nose-to-nose with the personal computer LAN giant.

"In the U.S.," Benhamou said, "we [3Com and Novell] enjoy a very cooperative attitude." Outside the U.S., he continued, the reigning mode is marketing Darwinism.

In Japan, 3Com looks fit enough to take on Novell, which



announced a Japanese joint venture earlier this year. Freeman said that NEC Corp., Hitachi Ltd. and Fujitsu Ltd. have all declared LAN Manager as their strategic PC networking product

NEC alone boasts 60% of the Japanese PC market, according to Benhamou. Furthermore, Nippon Telegraph & Telephone Corp. (NTT) currently distributes 3Com's 3+Open.

Freeman also pointed out that moving into Asia presents a more level playing field, one that is largely free of Novell's almost monolithic U.S. presence.

Rick Kimball, an analyst at Montgomery Securities, said "from a running start, there's no reason why 3Com won't do very well" in competition with Novell.

The best 3Com could hope for out of such a situation, Kimball added, "would probably be more of an even match."

The networking company formally announced the shipment of its Japanese language (Kanji) network operating system, 3+Open Kanji. Japan-based NTT and Nippon Electric Co. already have installed the PC software.

#### In the native tongue

The 3Com offering is the first Kanji network operating system on the market, according to Freeman. Written in Kanji, the system will also accept key English phrases that in some cases are difficult to translate. 3+Open Kanji does not translate the two languages. Transmission Control Protocol/Internet Protocol and Open Systems Interconnect versions will be shipped later this year, Freeman said.

The software was developed by 3Com/Soliton, a 1-year-old joint venture between 3Com and Soliton Systems K.K., a Tokyobased networking company.

The product announcement comes at a time when many wide- and local-area network companies are stretching beyond U.S. shores. All face formidable cultural problems, Freeman said.

Japan, for all its technological brilliance, has shied away from the individualistic nature of PCs, according to industry observers. The Japanese use roughly four million PCs, compared with the U.S.' 40 million, Benhamou stated.

#### Sequel shapes storage support

BY J. A. SAVAGE CW STAFF

SANTA CLARA, Calif. — Mainframe storage vendors today are faced with a dilemma. On one hand, they do not want to use up precious resources supporting dying technologies, and direct-access storage devices that use 14-in. platters certainly qualify for the rest home. On the other hand, there is an installed base that still needs support.

Sequel, Inc., a five-month-old spin-off from Unisys Corp., hopes to exploit that dilemma by taking the hardware remanufacturing out of the hands of vendors. Sequel started out with a contract to remanufacture Unisys' 14-in. disk drives. Last month, it expanded its scope by buying the high-end storage assets of Priam Corp.

#### Reaching for the brass ring

Sequel is also discussing remanufacturing contracts with "every other" 14-in. storage vendor, according to Marketing Vice-President Robert Hubbard. The entire market for repairs for 14- and 8-in. disk drives, he said, is about \$2 billion.

With the contract from Unisys and with Priam's old customers, Hubbard estimated Sequel's current share of that

market to be 7% to 8%.

"With companies like Digital [Equipment Corp.], they hate like hell to spend money on repairs; they want to spend it on new products," said Jim Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif. Porter said that Sequel has a shot at the market, although it is not a sure shot because vendors do maintain a "certain pride in ownership."

"Their story is believable," he said, estimating that Sequel has a solid three-to four-year business opportunity. "But as 14-in. drives begin to look like pterodactyls, they'll have to shrink."

Sequel does remanufacture 8-in. disks and drives — about 40 per day, compared with 110 14-in. drives, according to Hub-

bard. The company also makes about 30 51/4-in. drives per day, as a result of the Priam acquisition.

Hubbard estimated that Sequel has the capacity to make 200 per day each of 14-and 8-in. drives and another 300 of the 51/4-in. size.

Sequel is the only mainframe- oriented company of its kind because it has the "sophisticated" clean rooms necessary to carry out the processes, Porter said. Other storage remanufacturing companies exist, he said, but at the low end of the niche.

Those companies are "independents," Hubbard said, who reverse-engineer the drives. Sequel gets the necessary engineering information direct from the vender

# To train in Spain can be a real pain

BY CHRISTINE SIMONNET SPECIAL TO CW

With the 1992 Summer Olympic Games in Barcelona and the World's Fair in Seville, the end of the 20th century is witnessing the beginning of a Spanish commercial rebirth. Spain's businesses are now attempting to make up for lost time before the unified European market of 1993.

Finding the work force to staff the slew of new jobs, however, is proving to be difficult. "In Spain, there are many students with a degree from the Faculty of Arts, but we don't need this type of qualified work force," said Avelino Rodriguez, general secretary of the Franco-Spanish Chamber of Commerce. "We badly need engineers and data processing professionals."

However, many of the "help wanted" signs — two firms alone are reportedly looking for over 50,000 qualified people — are remaining in place.

#### Foreign exchange

Even on a small scale, there are already Franco-Spanish exchanges between students, teachers and research workers. Some agreements between schools enable young engineers to study for six months at a French or Spanish school or spend their last year of study in either country.

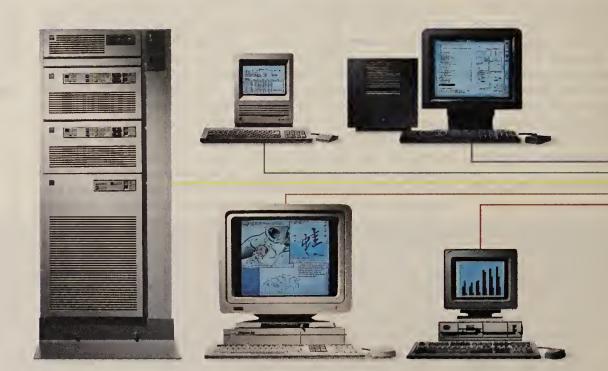
However, it is difficult, if not impossible, for a young French engineer to go to Spain as a trainee.

"Companies think they are wasting time training young people without being sure that they will stay in the country," said Maria Pasual, a student at the Telecoms Superior School in Madrid.

"Moreover, the Spanish government does not authorize this practice since they consider it disguised work," Pasual added. "Spanish students can only hold part-time jobs — 500 hours per year — if they want to have a little experience before their first job."

In addition, Spanish government regulations make it difficult to be hired by a Spanish firm; labor laws are still very protectionist. Any firm willing to hire a foreigner must first go to the National Institute for Employment (NIEM). If NIEM does not match the job profile with the file of an unemployed Spanish worker, the request is accepted.

# JUST BECAUSE YOU HAVE A LOT OF DIFFERENT COMPUTERS,



It's bad enough, mixing Macintosh, IBM PC, UNIX and mainframes in the same company—sometimes even within the same department. At least you should be able to standardize on one laser printer.

With PostScript' software from Adobe, you can.
As long as it's an Adobe PostScript printer,
it's compatible with all your different computers.
Because one thing those machines all have in common is genuine PostScript software from Adobe.
In fact, different computer platforms can actually

use the same PostScript printer—which greatly simplifies your buying decision.

And since employees can share PostScript printers, it could also save you money.

Of course, you know how important the Post-Script language is for printers that handle a lot of graphics and fonts. But do you also know that every type of software application—from word processing to desktop publishing, even spreadsheets—can output to a PostScript printer? And that's true for

POSTSCRIPT\*

Adobe, the Adobe logo. PostScript and the PostScript logo are trademarks of Adobe Systems Incorporated, registered in the U.S.A. Macintosh is a registered trademark of Apple

106

#### NET posts \$2.5M income drop

BY JIM NASH

REDWOOD CITY, Calif. — An overzealous sales office is being blamed for disappointing year-end financial figures at data communications vendor Network Equipment Technologies, Inc.

Net income for the fiscal year ended March 31 was down \$2.5 million from last year's total of \$16 million, according to the company.

NET executives revised their unaudited second- and third-quarter financial figures after external auditors discovered exaggerated revenue. According to infor-

mation released to the press, a September 1989 shipment worth about \$519,000 was listed as a booked deal, when it was not. That amount was erased from revenue statistics in the audit.

Revenue for the third quarter, originally stated at \$52.1 million, was decreased by \$5.4 million after a series of accounting errors — some traced back to the September mishaps — was discovered, according to company documents.

About \$2.4 million of the \$5.4 million was recovered through proper order documentation and reported in the fourth quarter.

As a result, NET Chief Executive Offi-

cer Bruce Smith said in a prepared statement, management foresees the company operating at break-even or perhaps even a small loss in the near term.

A little too aggressive

Company spokesman Stan DeVaughn said the problems stemmed from "a little too much aggressiveness" on the part of a handful of Eastern region salesmen, all of whom have since left NET.

"We have precise processing policies about when an order is considered an order, a shipment is a shipment, and when revenue is booked as revenue, and these policies were not followed," DeVaughn said.

DeVaughn said a new vice-president of sales, Craig Tysdale, had been appointed

in the incident's aftermath. Tysdale, NET's vice-president of marketing since 1989, replaced Roger Hobbs. The company did not comment on whether Hobbs' departure is related to the recent mishaps.

The appointment, however, apparently has not dispelled investors' misgivings. NET's stock price plummeted to 10¾ by the middle of last week after a 52-week high of 34¾.

# INTERNATIONAL RRIEFS

#### **DEC** to the defense

Where does a government contractor turn in a time of increasing peace and shrinking Defense Department budgets? Digital Equipment Corp. has an answer: to one of the defense departments still very much on active alert. DEC and Tel Aviv-based Israel Aircraft Industries — said to be Israel's largest manufacturing company — recently announced a strategic alliance under which DEC will serve as a systems integrator for its Israeli partner. Israel Aircraft, in turn, will standardize its computeraided design, manufacturing and engineering efforts on DEC workstations to the tune of an estimated \$25 million over the next five years.

#### Piece of the Apricot

Late May is the slated date for final contracts embodying the acquisition of UK-based Apricot Computers PLC's hardware division by Tokyobased Mitsubishi Electric Corp. The deal will create a new Mitsubishi subsidiary called Apricot Computers Ltd.; the former Apricot will continue its remaining software service business under the name of ART Group.

. . . . . . . . . . . . . . . . . . .

#### Help!

That, along with inventory management software, is what users in the UK want the most, according to information released by three large UK-based information center software providers. The burgeoning number of large commercial users craving software "Help desk" and inventory control packages leads them to estimate a \$1.6 million market niche by the end of this year, the companies' report said.

. . . . . . . . . . . . . . . . . . .

#### **Equita-Bull?**

Bull H. N. Information Systems, Inc. is set to pay \$376,350 for a 40% stake in Bridge Pacific, a networking specialist and computer dealer based in Auckland, New Zealand. According to one Bridge executive, negotiations between the two companies have been off-again, onagain for some 15 months. A recent slew of telecommunications contracts garnered by Bridge, he said, flipped the switch to on again.

# DOESN'T MEAN YOU NEED A LOT OF DIFFERENT PRINTERS.

every computer platform, from PCs to mainframes.

As you can see, no other printer can match an Adobe PostScript printer for compatibility. And since PostScript printers are easy to use, get the job done fast and produce great looking output, you won't find a safer, simpler buy.

Especially now that every major printer manufacturer offers a line of Adobe PostScript printers. So you're free to shop for the best features,

service and price.

We can't make the world of computers any simpler. But we can offer one beautifully simple printer solution.

PostScript software from Adobe.
For more information and a complete list of PostScript output devices, call

Adobe Systems at 1-800-952-6300, Department 123.



Computer, Inc. IBM is a registered trademark of International Business Machines Corp. UNIX is a registered trademark of AT&T Information Systems © 1990 Adobe Systems Incorporated. All rights reserved

# **COMPUTER CAREERS**

# Strolling down Wall Street

Securities firms are hiring, but their needs are limited and specialized

BY DAVID A. LUDLUM CW STAFF

espite what you may have heard, it's neither the best of times nor the worst of times for information systems people on Wall Street. Although some big investment houses have been laying off workers, business and hiring continue to chug along, but the pace is nothing like the breakneck rate typical of the '80s.

True, demand for some investment banking and brokerage services has slowed, and profit margins in others are under pressure. Both developments are forcing firms to cut back on spending. However, the situation also means the firms must compete more aggressively as new business opportunities arise (see story page 75).

In addition, the companies must replace computer systems that have been made nearly obsolete by globalization and other changes in the securities business. Firms must also integrate their existing systems so that management can keep real-time tabs on all the operations.

As recent earnings statements make clear, some firms are in a better position than others to hire new employees to deal with these challenges.

Firms with narrowly-focused strategies tend to be financially stable, while those with the broadest array of services have taken the biggest losses. "We're still recruiting," says Rick Adam, partner in charge of global operations and information

technology at Goldman, Sachs & Co. "There's still plenty of opportunity. I think people who read the press have a much darker view of the conditions than what's really going on here."

On the other hand, firms such as Merrill Lynch & Co. and Shearson Lehman Hutton, Inc. are methodically shrinking their work forces. Even so, Merrill Lynch, which took a \$470 million restructuring charge late last year, is hiring IS people, says Jeff Berg, manager of applications services. He declined to provide a number.

Jay Gaines, an executive recruiter in New York who places top IS managers on Wall Street, says he sees no lack of opportunity. However, he says people can no longer merely ride the explosive growth as some did during the 1980s. "Career progress will probably be less dramatic, more parallel to industrial companies or banks," Gaines says.

Among senior managers, the great demand is for people with a demonstrated ability to cut costs, increase productivity and manage the accompanying organizational change, according to Gaines. "When you're looking at individuals, you look at what

they accomplished with the resources they had and how well and how efficiently," he says. "There are people who have successfully streamlined organizations while maintaining or enhancing

productivity."

Imagination is another important attribute, says Howard Sorgen, director of information processing and technical services at Merrill Lynch. Managers must consider unconventional approaches to cutting costs, such as outsourcing and partnerships with suppliers and other companies. "It's a different type of thinking — creative rather than quantitative," he says.

In the technical ranks, the most sought-after people are the ones who can help companies deploy the distributed processing that can help securities traders and other revenue generators analyze markets more quickly, managers and recruiters say.

This priority calls for profes-

sionals skilled in C programming and high-end, multitasking personal computers or Unix workstations with graphical, windows-based interfaces.

Relational databases are another important component of the distributed approach. They also relate to a second critical While the chances of landing a choice position or moving up in the securities industry ranks are not as great as in recent years, observers say that pay for the people who do get the opportunities will remain healthy.

Wall Street will continue to boast many of the highest-paid

HE GREAT demand is for people with a demonstrated ability to cut costs, increase productivity and manage the accompanying organizational change.

technological thrust at securities firms — the streamlining and modernization of software development. Companies are standardizing data structures and application interfaces to eliminate redundancies and to allow programs to be integrated.

Merrill Lynch is moving toward a more specialized division of labor in application development, Berg says. Increasingly, the work is divided among technical specialists who provide development tools and businessoriented people who ferret out requirements and define software functions.

The latter group must understand what users need from applications and translate it into software, using a limited set of high-level tools. "You have to know the users' business almost as well as he does — you're the person recommending improvements to it," Berg says.

and creativity

IS positions, some of them with seven-figure compensation. Further down in the organization, senior applications programmers can still earn \$60,000 to \$80,000 per year, and project managers can earn \$125,000 to \$200,000.

If the pay does not return to the extravagant levels it occasionally reached in the 1980s, the pressure may not be as great either.

"Wall Street was paying incredibly well in terms of DP, but people were working incredibly long hours," says Jessica Keyes, a consultant and former managing director of technology at the New York Stock Exchange. "In return for that money, the firm had some expectations. It expected seven days a week. It expected blood."

Ludlum is a *Computerworld* senior writer.

Want to increase the value of your professional portfolio?

Diversify your experience by joining American General Finance!



American General Finance

A Subsidiary of American General Corporation

AMERICAN GENERAL FINANCE, with over 1,100 offices in 42 states, seeks highly motivated data processing professionals for its national headquarters in Evansville, Indiana.

Working on an IBM 3090, our programmers and analysts provide the systems which link the Company's national branch network. Our environment also includes MVS/XA and CICS.

#### PROJECT ANALYST

As a Project Analyst, your responsibilities would include coordination of financial systems and the general ledger systems. This includes leading junior staff members. Prerequisites include a Bachelor's degree and at least 8 years experience.

#### SYSTEMS ANALYST

If you have at least 6 years experience with insurance or banking applications plus proficiency in COBOL and/or Assembler, this position may be for you.

AMERICAN GENERAL FINANCE offers a complete benefits package that includes paid interviewing and relocation expenses, plus an attractive salary program.

For immediate consideration, send your resume and salary history to Mary E. Huth, Personnel Representative, Human Resources Dept., P.O. Box 59, Evansville, IN 47701.

Equal Opportunity Employer

# BE PART OF A GRANDE TEAM

PROGRAMMER/ANALYSTS here's what YOU get by joining Williams-Sonoma's GRANDE TEAM:

- Exposure to the latest technology AS400, PS/2.
- Excellent career advancement opportunities tailored to broaden YOUR interests.
- Active participation in technical seminars to further develop YOUR skills.
   An environment that fosters YOUR ideas, imagination

Come experience a personally rewarding opportunity and be a contributor in a leading San Francisco-based company. Here's what we need from YOU:

- System 38 or AS400 experience
- RPGIII knowledgeSystems design
- Unlimited creativity

Our commitment to our people is strong and we want individuals who are ready to test their skills in a dynamic environment.

For more information call: Michael Brand, Human Resources Manager (415) 421-7900, ext. 341.



#### Is Your Career on a



#### FREE Computer Salary Survey Will Show You!

Learn the facts about:

- Computer industry growth trends
- How to assess your current position and potential
- The 1990 "going rates"
- Strategies you can use to upgrade your career - and earn a bundle more!

To get your free Survey, just call us. Source Edp is the leading recruiting firm that specializes exclusively in the computer profession. There's no cost or obligation.

#### Call this week 1-800-432-4473, ext. 148

Or write to: Source Edp, P.O. Box 152109, Department NK1, Irving, TX 75015-2109. (If you write to request a copy, please include your position title and home



#### **TECHNICAL SPECIALIST**

Health Net, one of California's fastest growing HMO's with over 740,000 satisfied members, has an excellent opportunity available for a Technical

In this position you'll build, maintain, monitor and fine tune ACMS applications/systems and DBA. You must have years technical experience in VAX ACMS, coding, building, monitoring and fine tuning ACMS applications/systems. Minimum of 5 years experience in VAX/VMS environment is required along with 1-2 years CDD experience. A background with relational database concept (preferably Rdb, V3.0) and Forms Management System (TDMS and or DEC forms is preferred).

We offer an excellent benefits package that includes medical, dental, vision, life insurance, 401k, tuition reimbursement, health club reimbursement and 17 paid time-off days per year. For prompt consideration, please send your resume to: Health Net, Human Resources, 21600 Oxnard Street, Suite 2080, Woodland Hills, CA 91367. We are an equal opportunity employer that maintains a nonsmoking environment.



**HEALTH NET** 

California's HMO

#### SOFTWARE **OPPORTUNITIES**

1-800-423-5383

et our National Award win computer specialists assist you n your search. We have over 100 affiliated offices around the country ready to work for you

BOL or ALC)

IMS or ADABAS or VM INTERNALS

ROBERT SHIELDS & **ASSOCIATES** Houston, TX 77289-0723

FAX: 713-486-1496

MAY 14, 1990

#### Sunbelt Opportunities

AS/400 · S/38 Prog/Anal's	30-37K
DB2/SQL Prog/Anal's	30-40K
MSA or M&D Prog/Anal's	33-40K
CICS Prog/Anal's	30-36K
TANDEM Prog/Anal's	30-38K
UNIVAC 1100 Prog/Anal's	30-35K
ADABAS/NAT Prog/Anal's	30-36K
DATACOM/IDEAL Prog/Anal's	
HP 3000-COBOL Prog/Anal's	
ORACLE-SQL Prog/Anal's	30-39K
VAX/COBOL Prog/Anal's	32-36K
FOCUS Prog/Anal's	29-35K
IDMS-ADS/O Prog/Anal's	29-35K
ASSEMBLER Prog/Anal's	29-34K
EDP Auditors	33-43K

North Carolina's largest employment agency, in business since 1975, 300 affiliates Opportunities in the Southeast and nationwide.

Corporate Por Personnel Consultants

3705-320 Latrobe Drive, Box 221739 Charlotte, NC 28222 (704) 366-1800 Attn: Rick Young, C.P.C.



INFORMATION SYSTEMS SPECIALISTS

LEAD P/A

Major West Coast financial institution needs seasoned COBOL CICS P/A with solid knowledge of MVS/XA JCL & integrated banking software. SYSTEM-ATICS exp a +. SFO101 \$50K

HOGAN

Large national financial institution is consolidating and moving their systems development functions to Houston. Positions require 2-5 years experience with HOGAN software and IBM mainframe. \$50K HOU100

P/As and DBAs

Large national consulting firm seeks P/As and DBAs with 3+yrs IBM mainframe, COBOL, OS/MVS0, DB2, CICS, and/or IMS. Positions available in Austin, TX and across the country \$33-55K AUS101

**DB2/ORACLE** 

Nat'l consult firm seeks indivs w/3-10 yrs, Case Tools, SQL, DB DES, Modeling. Opptys in-Wash/Balt, Atlanta & Calif fill relo ex. benefits. Limited travel. Call San Diego for more de-\$50-120K **SAN101** 

**PROGRAMMER** Exciting and challenging position available in So. California for PRGI-II/AS400/SYS38 programmer. Great industry, very progressive environment! Call Now! \$60K LAX102 TANDEM SR P/A

Join the exciting growth of the Pacific NW. Close-knit team needs key-player w/3+ yrs Tandem COBOL/Pathway dvlpmnt experience. Leadership & medical systems exp a plus. \$35-40K

PROG/ANALYST Leading Dallas Based software firm needs multiple programmer/analysts w/2 yrs. RPG III coding experience. Openings for both support and development depts. Dial RH board modem. 214/987-1957

**DFW101** 

TANDEM SR P/A

State-of-the-Art Midwest shop has immediate need for a progr/analyst with strong CICS skills. Recommending software/hardware solutions, design programs and systems.Excellent compensation and benefit package.

SR PROG/DESIGN **ANALYST** 

Large San Antonio based firm is seeking several IBM Mainframe "Pros" with CICS + COBOL. Advanced technology plans include CASE Tools, Satellite Communications and Image Processing. Top benefits + relo. \$45K SAT101 \$45K

PROG/ANALYST

Manufacturing company in need of several quality HP3000, COBOL programmers. Outstanding opportunity for a take charge person who wants to grow with department. Image required. Must have 4+ years expensions stable work history.

CHI103

- Call the Robert Half office nearest you -(please refer to the underlined six digit job code)

California California
Los Angeles
(213) 386-6805
FAX (213) 487-0826
San Diego
(619) 291-7990
FAX (619) 296-8784
San Francisco
(415) 434-1900
FAX (415) 434-0705
San Jose
(408) 293-9040
FAX (408) 293-1509
Connecticut

Connecticut Hartford (203) 278-7170 FAX (203) 278-0320

Illinois Chicago (312) 616-8200 FAX (312) 616-1155 Oakbrook (708) 571-7074 FAX (708) 541-0405

Michigan Southfield (313) 358-2300 FAX (313) 358-0941

Missouri St. Louis (800) 922-HALF FAX (314) 727-1321 SR P/A

Electrical manufacturing company in western suburbs of Chicago seeks person with 5+ yrs. experience in manufacturing with expertise in LAN, Revelation, and RPG II to lead migration of mainframe applications to PC net-\$40K OKB101

SR P/A

Fast growing Chicago area PC parts and IBM manufacturers is in dire need of HP/3000 expertise. Must have experience with Image database program in Cobol and worked with power-house. Mail order experience is a plus. OKB102 \$35K

> REMOTE **TELECOM ENG**

Outstanding oppty exists for you to use your VOICE-DATA COMM skills to design, install and maint a new remote facility for this major financial institution. Knowledge of AT&T System 85 & 75, DDS, T1, LANS. Excell oppty for growth, bene's & training. Full relo. HTF102

> STRATUS/IBM **S/88**

Suburban Phila firm; one of the fastest growing companies in the US is starting a major development effort on STRATUS Systems. Outstanding opportunities for programmers, project leaders and system support professionals with STRATUS or IBM S/88 experience. C or COBOL PHL101 \$60K

**DB ANALYST** 

Progressive consulting firm searches for dynamic individuals with expertise in either Oracle or DB2. Company anticipates nat'l expansion providing tremendous career growth potential. **BUF101** 

> SALES CONSULTANT

Employee oriented Nat'l Corp. with superior comp. & benefits pkg. seeks degreed ind. with MF systems sales back-ground. Req. 3+ yrs sales/mkt. exp. with MFG, CPIM, MRPII. Some travel \$Base + Comm BLO101

SYS/38 - AS/400

Charlotte based co seeks strong RPGIII professionals to move into their new AS400 environment. Oppty to learn AS400 and make solid contributions. Manufacturing and/or Mapics exp. a plus. Full relo. \$45K CL **CLT102** 

> **SOFTWARE ENGINEER**

Leading N.C. firm specializing in micro-development technology has immed. need for Jr./Sr. Engs. 3+yrs exp. in C or Assembler req'd. Solid know. of DOS, UNIX or OS/2 highly desired. Leading edge tech develop! \$55K CLT103

MSA/McCORMICK & DODGE

The nation's leading MSA consulting firm is seeking individuals with strong MSA or McCor-mick & Dodge exp. This fast paced organ, provides an exc. oppt. for motivated performers with solid tech. & comm **RAL100** 

Together, We'll Find What You Need.

> OS/2 SOFTWARE DESIGNER

Help an entrepreneural team sponsored by an in-dustry giant dev. tommor-row's CASE tech. Must possess proven OS/2 and software design exp. Formal design methodology and MVS mainframe experience a plus. \$80K+ **RAL101** 

AS400 RPG III

Growing international company seeks RPGIII Analyst. Pansophic, MAPICS or MRP experience preferred. STF103 \$50K

**AS400 RPG III** 

Growing New York based service company seeks several strong analysts with three plus years of Paradox experience to work as outside consultants. Excellent benefits & long-term track within the organization. \$50-100K **NYC102** 

SYS ANALYST

Specialized ad agency based in New York seeks individuals with ten plus years experience and a minimum of two years heavy oracle exposure. Supervise staff, Benefits include profit sharing and tuition. \$60K NYC103

**DB ANALYST** 

Leading electronics firm located in the Silicon Val-ley needs Sr level DBA responsible for installing & maintaining company data bank. IDMS/ADSO & VM/VSE environment. \$50-55K SJC101

P/A through S/A With strong Cobol skills. Large national company seeks aggressive self-motivated individual. Background in CICS or IDMS a plus. \$30-43K

STF102

Minnesota FAX (612) 893-0833

**New York** Buffalo (716) 842-0801 FAX (716) 842-0470 Midtown (212) 221-6500 FAX (212) 575-3050

**North Carolina** Charlotte (704) 339-0550 FAX (704) 342-2700 Raleigh (919) 787-8226 FAX (919) 782-9625

Pennsylvania Philadelphia (215) 568-4580 FAX (215) 561-4434

Austin FAX (512) 835-4584 Dallas (214) 363-3300 FAX (214) 373-7480 Houston (713) 623-4700 FAX (713) 623-6782 San Antonio (512) 736-2467 FAX (512) 737-2417

**Washington**Seattle
(206) 624-9000
FAX (206) 624-5093

© 1990 Robert Half International Inc.



the following skills:

CASE TOOLS FOCUS PL/1 ORACLE CICS IMS 08/00 OB2/SOL VAX AS400-S/38 UNIX M&D OR MSA S/P MVS IDMS **IMS ASSEMBLER** HP3000 PC TANOEM/TAL PATHWAY/SCOBOL

12225 28th St. N 2005 W Cypress Creek Rd St Petersburg, FL 33716 Ft Lauderdale, FL 33309 813-573-2626

800-777-8603

305-771-8603

Serving

South Florida

800-888-1064 Sarving Tampa Bay

Orlando, FL 32801 800-888-1064 Sarving Jacksonville &

20 North Orange Ave

COMPUTERPEOPLE



CINCOM, a leading worldwide supplier of system and application software, has immediate openings for software professionals. These positions require experience in the design and implementation of IBM mainframe, VAX and/or UNIX systems software products, or systems programming experience with multiple operating systems.

These positions require a strong working knowledge of ASSEMBLER, PASCAL and/or "C", in the MVS/XA, VSE, VM/CMS, or UNIX environments.

Positions are available for software personnel with skills in the following areas:

- IBM mainframe using ASSEMBLER or PASCAL CICS, DB2, and SQL
- UNIX systems software experience
- VAX/VMS and DECnet

- Team building skills
   Software engineering skills
  - · Project management skills

Prior experience with Cincom products (SUPRA, TIS, MANTIS), data base products, or fourth generation languages would be a definite plus.

If a creative and challenging software position is of interest to you, please forward your resume and salary history to:



Patti Swillinger, Dept. TC 2300 Montana Avenue Cincinnati, OH 45211

## Big Apple has a few bruises

High cost of living, crime are driving IS jobs to suburbs

BY KIM NASH

ew York is a happening place. Business professionals are enticed by the sheer volume of the city's career opportunities and by its reputation for being just a step ahead of the rest of the world.

Information systems organizations anchored here mirror that chic, fast-paced image. "That saying, 'If you can make it here, you'll make it anywhere,' is the same for IS professionals," says Peter Fiorillo, president of executive recruiting firm Robert Half International/Accountemps, Inc.

What information systems people seek and find in the New York area are stable companies that offer advanced technology and good compensation.

But there are cracks in the facade. The city's high cost of living, overcrowding and crime are deterrents to a lot of people. To avoid them, many urban professionals seek refuge in suburban homes, generally in Westchester County, Long Island, Northern New Jersey and Connecticut's Fairfield County.

What is good for workers is also good for business. In recent years, there has been a push by some New York-based corporations to relocate data centers and other facilities to these less costly and less cramped locales.

Outside the city, the greatest demand for IS people is in Bergen and Passaic counties in New Jersey, where major insurance companies and accounting and law firms have moved programming operations, Fiorillo says.

Long Island is another region bursting with new installations. B. Dalton Book-

Nash is a Computerworld researcher, features.

seller, Inc., the book retailer, is moving there and looking for computer people, according to Fiorillo.

While programmers can work in the suburbs, higher level IS executives generally continue to commute into the city because they report to the top headquarters people who work there. The potentially long commute from an attractive suburb is one of the issues they tackle when considering a job in New York, says Norm Sanders, managing director of Russell Reynolds and Associates, Inc., a New York-based executive recruiting organi-

One of the major attractions of working in the New York area is the healthy salary levels (see chart this page). "If you're good, you can make more money here than anywhere else," Fiorillo says.

In addition, organizations in the region are often among the first to explore emerging technologies such as imaging, transaction processing and local-area networking, Sanders says.

The New York Transit Authority, for example, is piloting imaging projects, says Bill Heuser, the authority's vice-president of information services.

Heuser says his department needs people with experience in personal computer-based development languages and databases. "We've never had to go out and hire people like that before," he says.

Sanders and Fiorillo say that experience with local-area networks is also a valuable asset on an applicant's resume.

In the management ranks, the transit authority and other organizations are emphasizing the alignment of information systems with business strategy. "In the past year, we've moved to a structure geared toward the overall corporate management of information resources," Heuser says. Two assistant vice-presidents in



Unemployment rate Metropolitan New York (NYC, Long Island, Northern N.J., Stomford, Conn. orea)



Source; N.Y. Department of Labor, Research and Statistics

Average housing costs



Source: National Association of Realtors Weighted for population of multiple metropolitan areas

IS handle strategic planning issues, while two others oversee tactical, day-to-day concerns in operations, communications and applications development.

Transportation is no different from other industries when it comes to IS structure, he says. As a result, Heuser

\$70K

\$70K

\$68K

\$50K

\$45K

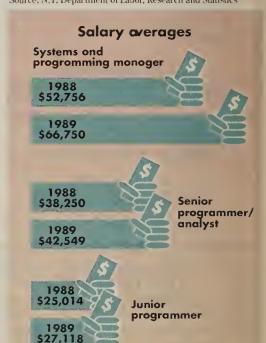
\$45K

150 Moter Pkwy Hauppauge, NY 11788 (516) 231-3131 fax (516) 231-3724

#### Largest employers: (By number of employees)

- City of New York
- New York City Board of Education
- New York Transit Authority
- New York City Health and Hospital Corporation
- Citibank
- •New York Telephone
- Chase Manhattan Bank New York City Housing
- Authority Manufacturers Hanover

Source: N.Y. Department of Labor, Research and Statistics



Source: 1988, 1989 CW salary surveys CW Chart: Tom Monahan

competes heavily with other industries for quality staff. "We're all out there looking for good members in areas like mainframe applications, communications and local-area networking," he says.

Research and statistics compiled by CW features copy editor Cathleen Duffy.

#### NEW YORK REGIONAL SCOPE

New York City Teachers' Retirement System, one of the largest public pension systems in the nation, seeks dynamic computer professionals to implement and support state-ofthe-art technology for the following:

- ☐ Interactive Voice Response System
- ☐ Document Image Processing System □ Expert System
- □ Desktop Publishing System

Systems/Business Analysts and Programmer positions are also available in the following applications development

- ☐ Hewlett Packard 3000 Minicomputer
- □ Novell Local Area Network
- ☐ Personal Computer MS-DOS IBM PS/2

All candidates must possess a college degree and 2 years of experience in the above field(s) of interest. Applicants should have well developed analytical, technical writing and oral communication skills along with the ability to interact with individuals at all levels.

If you are interested in an exciting and rewarding career, please send your resume and salary history to the address shown below. Competitive salaries. Principals only. An Equal Opportunity Employer.



**New York City Teachers' Retirement System** Recruitment Office 40 Worth Street, Room 1407 New York, New York 10013

#### PROG/ANALYST \$50-150K

Paradox Specialist: creative, sharp analyst with clipper & oracale a plus. Large data management company. Excellent growth potential and benefits. Contact Lee Feldstein, Midtown loca-

DBA DB2 and IMS BUS SYS MGR Minis, Int'l Co. SYS SPEC. TPF, BAL, ATM PA IMS DB/DC heavy PA RPG III, SYS38, AS400 **EDP AUDITOR** 

522 Fifth Avenue New York, NY 10036 (212) 221-5600 fax (212) 575-3050

WALL STREET 67 Wall Street New York, NY 10005 (212) 785-8300 fax (212) 785-8399

186 Joralemon Street Brooklyn, NY 11201 (718) 797-4400 fax (718) 797-4599

LONG ISLAND 99 Jericho Tpke Jericho, NY 11753 (516) 333-2121 fax (516) 333-2188

East 210, Rte 4 Paramus, NJ 07652 (201) 843-3700 fax (201) 843-3977

200 Middlesex Tpke Iselin, NJ 08830 (201) 634-7200 fax (201) 634-1594



International Passenger Shipping/ Hotel and Resort Firm Seeks:

#### SENIOR PROGRAMMER **ANALY51**

**MIDTOWN MANHATTAN** 

Develop new and modify existing systems to provide business data. Provide support and development to users. Design new systems, write specs and programs, implement new systems and su-pervise junior staff as required. B/S Degree and supv./project leader experience preferred. RPG III experience preferred and 2-3 years systems analysis/project experience required.

Convenient to major bus/train routes. Competitive salary and excellent benefits include 14 days free cruise travel. Please submit salary history with resume for consideration to:

CUNARD LINE, LTD.

Personnel Department 555 5th Avenue, New York, NY 10017

NO AGENCY CALLS ACCEPTED Equal Opportunity Employer

The Missing Link in D.P. Recruiting

**Immediate** Contracts **Full Time Positions** Available:

Call or Fax resume to:

Corporation 153 Waverly Pl. Ste 3-7th Fl. N.Y., N.Y. 10014

212-243-5488 Fax# 212-989-6457

#### **PROGRAMMER ANALYSTS**

DB2/CICS VAX PC-C

International bank, recognized as one of the most profitable and best-run firms, is expanding its MIS department in the 3 areas. We seek bright, highly motivated candidates w/ 2-5 years of exp. to develop brand new CICS/ DB2-based trading systems; VAX/C/ORACLE ferris; VAX/C/ORACLE
foreign exchange, money
market, and mortgage
backed securities systems; and PC/C/MSWINDOWS workstation
systems. BS/MS in Comsystems. BS/mS in Computer Science preferred puter Science preferred. We offer excellent starting salaries \$39-60K plus 30salanes \$39-60N plus 30/40% bonus. 3-4 weeks vacation. If you are not challenged in your current position, please respond ASAP to: P.O. Box 1531, NY, NY 10268

#### **EIS CONSULTANT**

Pilot Executive Software has an immediate opening for an EIS Solutions Consultant in the New York/New Jersey area. Pilot Solutions Consultants work with technical staff from leading corporations around the world to implement executive information systems.

Candidates must possess hands-on experience in the design and implementation of executive information systems using PILOT Executive Software's Command Center. In addition to a willingness to travel, strong technical, analytical, and interpersonal skills are essential.

PILOT Executive Software offers an excellent compensation pack-age comprised of salary, benefits, and stock options. Qualified candi-dates should forward resumes and salary requirements to:

Colleen Alice Davy
PILOT Excecutive Software
40 Broad Street
Boston, MA 02109
FAX: (617) 350-7118

An equal opportunity employer \*No phone calls please



**EXECUTIVE SOFTWARE** 

**Great CONSULTING** 

Assignmentsl and Exceptional **Opportunities** 

Call & send your resume to

MIMI SIMON ASSOC.

(212) 406-1705 Fax # (212) 406-1768

Specialists in database technology consulting and training, Spectrum has established an excellent reputation for providing leadership in data and business analysis, technology assessments, Logical Data Modeling, CASE, database design and implementation.

At present, we are looking for Sr. Systems Analysts, Data Analysts, Database Administrators and Programmer Analysts with experience in one or more of the following:

- ► ORACLE
- **INFORMIX**
- CASE Technology ► Logical Data Modeling

At Spectrum, you will discover a refreshing philosophy amongst uni-quely loyal coworkers who encourage shared insight and expertise. Staying technically current is the natural result of our commitment to internal education, participation and leader-ship in professional and technical groups and challenging assignments.

We offer excellent salary and benefits. If you believe you are one of the truly exceptional professionals we are looking for, we want to talk with you.

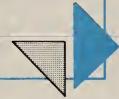
For immediate and confidential consideration, please call or write our offices today.

New Jersey Judy Dirk/Todd Collier 1250 Route 28, P.O. Box 5365 North Branch, NJ 08876 (201) 725-4000

Florida Terry Wilkes 2180 West S.R. 434, Suite 4148 Longwood, FL 32779 (407) 682-1300



Bob Giordano



#### SUCCESS MEANS BEING IN THE RIGHT PLACE

AT THE RIGHT TIME ...

"I entered

the consulting

current. After

field to stay

technically

seven years

Spectrum,

that's precisely

what I am."

with

. And The Time is Right To Join CHC in Rockland, Orange & Putnam Counties in New York



#### New PL/1 Project Team Is Forming ACT AT ONCE!

When you're a Computer Horizons Consultant, you'll find yourself in the right place for success...everyday! As one of the nation's leading Data Processing Consulting firms, we've proven our success time and again by opening new services in a variety of markets.

Computer Horizons is staffing a brand new project team to support all the Mission Critical systems in the manufacturing and engineering areas of our client. As a CHC consultant, you will be involved in all areas of the project life cycle. We are looking for experienced:

- **SYSTEMS ARCHITECTS**
- SR. LEVEL DESIGNERS
- ANALYSTS
- SENIOR PROGRAMMER ANALYSTS

to join this elite team of CHC consultants that we are forming now. To be considered you must possess strong DP skills and have a strong desire to get the job done. Additionally, you must be able to function in a DP environment that consists of:

- IMS and/or PL/1
- IBM OS MVS

Special attention will be given to Programmer Analysts with strong PL / 1 experience. IMS is not required in all positions. This project team will have full responsibility for all manufacturing and engineering applications.

As part of the CHC team, you'll earn an excellent compensation package that includes an above-average salary and outstanding benefits including life, health, major medical and dental insurance, relocation assistance and a deferred income savings plan (401K).

★ If you're hired as a result of this ad you will earn a \$2,000 sign-on bonus paid on your 90th day of continuous employment.

For more information, please contact David Reingold at (201) 402-7400 or FAX him your resume Immediately at (201) 402-7986. Outside of New Jersey, call Toll Free 1-800-321-2421. COMPUTER HORIZONS CORP., 49 Old Bloomfield Avenue, Mountain Lakes, NJ 07046-1495.



COMPUTER **HORIZONS** CORP.

"The Solution Experts"

An Equal Opportunity Employer M/F

Our name is easy to pronounce in any language

We are an information technology joint venture between two world class management consulting firms, Deloitte & Touche and Tohmatsu & Company, and have created a unique resource for our major Japanese & American clients doing business in the New York area. We offer exceptional career opportunities for individals joining us at this exciting time.

#### SYSTEMS IMPLEMENTATION PROFESSIONALS

We seek Systems Professionals with 2+ years experience in systems analysis and design, programming and implementation. Candidates will be technically adept, project-oriented and capable of hiring and supervising their own project teams. Primary responsibilities include installation and implementation of data processing and management information solutions. tion solutions.

Specific application and/or platform experience:

- AS/400, S/38
- PCWORKSTATIONS (IBM, SUN, DEC)5GL's, UNIX, C, LANS, WINDOWS
- TELECOMMUNICATIONS
- OPEN SYSTEMS, SYSTEMS INTEGRATION
- IMAGE PROCESSING

Among the professional advantages:

- Commitment to training Update your skills in the latest methods and technologies through company-paid programs.
- You'll find plenty of autonomy in an organization geared to action, not bureaucracy.

We're young and eager, and foresee tremendous potential for growth in the coming years. Pursue the direction of your choice.

DRT believes its people should be participants in its success. Therefore, we provide an incentive-based compensation package with a base salary commensurate with your experience and an exceptional package of ben-

If you're looking for a real opportunity for stimulating work, financial reward, professional growth, and meet our qualifications, please send your resume and cover letter to: **Director of Human Resources**.



Systems Ltd.

1633 Broadway, 7th Floor, New York, N.Y. 10019 An Equal Opportunity Employer

#### **TO DEVELOP** TOP PROGRAMS, YOU HAVE TO JOIN A TOP ORGANIZATION

Here's your opportunity to develop top programs with Caldor, a leading discount retailer. We're almost a \$1.7 billion giant, with 118 stores (throughout the Northeast) and more planned.

These advancement-oriented positions, at our corporate data center will be involved in the support of our large scale state-of-theart IBM mainframe environment.

- Programmer Analyst
- •MVS/XA or VTAM Systems Programmer
- Project Manager
- Network Control Supervisor

Our high tech environment includes: IBM 3090-300E, MVS/XA, JCL, JES2, CA/UCC products, COBOL, ACF2, CICS on-line system, CA-DATACOM/DB DBMS and CA-IDEAL 4GL data base.

Opportunities at Caldor include training, competitive salaries, and a comprehensive benefits package including medical/life insurance, profit sharing and more. We are conveniently located in Norwalk, CT (1 hour from NYC).

For immediate consideration, interested candidates should call (203) 849-2436; fax (203) 849-2135; or send your resume with salary history, to: N.L.L., Manager Recruiting & Placement, CALDOR, INC., 20 Glover Avenue, Norwalk, CT 06856. We are an equal opportunity employer M/F.

#### CALDOR

Our quality starts with careers

#### <u>new vork . cornell</u>

#### MIS PROFESSIONALS

Work in our technologically advanced IBM PC environment at our world-renowned teaching medical center. Opportunities presently exist for professionals with a BA/BS in computer science or equivalent, as well as excellent interpersonal skills.

#### Manager Office Automation

Position requires an individual who possesses proficiency in Multimate WP, Database, D-Base 3,4 and LOTUS 1-2-3, as well as a minimum of 5 years experience with networking and IBM PC product usage. Previous hospital background and familiarity with medical terminology are definite pluses.

#### Senior Programmers (2)

Pur your 3 years of IBM mainframe hospital experience to work. The candidates must have a thorough knowledge of COBOL, CICS, MVS,

#### Sr. Data Base Specialist

Disaster recovery with IMS/VSAM plus a minimum of 5 years experience is sought for this position. Proficiency in MVS, IMS/VSAM, IRLM-DBRC with CICS experience. Responsibilities include DBD/PSB/ACB, GENs along with IMS/VSAM tuning and space management.

#### System Analyst/ **Operating Room Scheduling System**

Use your supervisory expertise to coordinate the varied work loads of numerous people. Reporting to the Director of Clinical Services, assume responsibility for departmental budgeting and heavy user interface. Hospital background a must.

#### **Data Base Analyst**

This is a great position for a professional with Mainframe and PC Network System coupled with 3-5 years proficiency in LOTUS, D-Base, Word Perfect and Multimate. Background in report generation and modification on a Mainframe using the (InSci) HR/payroll system is required. The ability to train PC users is a must system design and troubleshooting. users is a must; system design and troubleshooting expertise is a plus. Background in a confidential environment is essential.

An excellent salary and benefit package await the right candidates. Please forward resume and salary history indicating position of interest.

525 E. 68th Street, New York, NY 10021 EEO M/F

#### **INFORMATION SYSTEMS**

#### **OPPORTUNITIES**

#### We've got a system for success.

At Toshiba, world leaders in consumer electronics, our Information Systems professionals find both challenges to match their skills, and the ongoing opportunities to match their ambition. If this sounds like the type of environment you're seeking, consider the following career-oriented opportunities:

#### SENIOR PROGRAMMER/ANALYST (5+ plus years experience)

#### PROGRAMMER/ANALYST (2-3 years experience)

In these positions you will be responsible for the design and implementation of new and modified applications. Additional responsibilities include coding, testing, debugging and maintenance, as well as coordinating applications with users.

These challenging opportunities require a solid working knowledge of RPG III, IBM AS/400 and System 38, interactive and batch programming, and debugging/problem-solving skills. Top communication skills are essential.

#### SYSTEMS ANALYST

Your duties in this integral position include the establishment of end-user computing systems, DataBase preparation in AS/400 for PC download, documentation of system design and a user's manual, and the development of typical applications using LOTUS 1-2-3.

To meet these challenges, you should possess a BA/BS degree in Computer Science or Business Administration, along with solid documentation and user interface skills and a working knowledge of the following: DataBase on mainframe, AS/400 or SYS/38, MS-DOS, LOTUS 1-2-3, PC LAN and connectivity to mainframe or AS/400.

We offer a state-of-the-art working environment, competitive salaries, comprehensive benefits, and every opportunity for professional advancement. For immediate consideration, please send your resume, indicating the desired position and your salary expectations, in confidence to:

Personnel Manager, Department IS411

TOSHIBA AMERICA CONSUMER PRODUCTS, INC. 82 Totowa Road Wayne, New Jersey 07470

An Equal Opportunity Employer

#### Why Top DP Professionals Become Cornell Consultants **EXPERT SYSTEMS**

Cornell Computer Corp. is the leader in providing system development expertise of the highest caliber to Fortune 500 corporations. Over the years our clients have come to expect from us only the very best in application and technical skills together with excellent interpersonal capabilities. As a result, demand for our professional services has never been stronger.

If you are an aggressive professional seeking challenging work and satisfying rewards in diversified applications, we are what you have been looking for.

We offer numerous opportunities for the Software Professional motivated by financial rewards, technical challenges and career advancement. Positions are available for a wide range of professionals with a minimum of two years experience.

We offer excellent salaries and a full benefits program. Contact the office nearest you for further details

Richard DeLisi or Eric Bauman CORNELL COMPUTER CORP.
1500 BROADWAY-7th Floor NEW YORK, NY 10036 EDISON, NJ 08837 TEL: 212-382-2345 FAX: 212-382-0879 FAX: 201-549-9826



#### **Computer Power Group**

Cornell Computer Corp. USA-Europe Asia-Australia An Equal Opportunity Employee

#### KNOWLEDGE ENGINEER

Design and implement expert systems in UNIX® development environment. Perform knowledge acquisition and application assessment. Develop software to integrate expert systems into existing operations environments. Strong computer science background, good listening & interpersonal skills, and familiarity with Unix required.

Desirable experience: Familiarity with Lisp or C, familiarity with Rule-Based and Object-Oriented programming, knowledge of expert system development tools, large software systems development experience.

Join NYNEX and you can be a key force in the future of the information industry. We offer competitive salaries and excellent benefits/training/relocation programs. To further explore your future at NYNEX, please send your resume to:



NYNEX Science & Technologies Center je Room IA4, 500 Westchester Avenue White Plains, New York 10604

An Equal Opportunity Employer

#### PROGRAMMER ALYSTS CONSULTANTS NY/NJ

- \* CICS DB2
  \* SR. STRATUS PL/1
  \* STRATUS SYS AD
  \* UNIX Sys V Perf
  \* INFORMIX 4GL
  \* FOCUS W/TERRADATA
  \* COBOL W/RAMIS
  \* VAX/VMS MMS CMS
  \* OBACLE INIX/S
- ORACLE UNIX/C IMS/DB2 Data Manager
- UNIX/C OSI Standards UNIX System Test SYBASE UNIX/C
- Oracle VAX/VMS SR. X Windows
- IMS DB/DC PL/1 SYSTEMATICS Software
- Call or send resume to GRANT KEAST

Aztec Consulting Services, Inc. 530 Main St, Dept CW, Ft Lee NJ 07024

(201) 461-7200 (212) 307-7259

#### SYSTEMS PROFESSIONALS

**FULL TIME POSITIONS** 

ONLINE/REALTIME "C", PASCAL . . 25 -R & D Environment UNIX/VMS/MSDOS Transaction Processing

MANAGEMENT CONSULTING . . . . 50 - 100K Technical/Quant. Background MBA, 3 + yrs Exp.

IBM MAINFRAME COBOL.....30 - 60K CICS and Database New Dev. F/X sys

OS/2 PLATFORM "C" .....30 - 70K Front office Trading Systems

IBM MAINFRAME FOCUS . . . . . . . . . 30 - 60K State of the art data center Internal Consultant

#### **EXEC-COMPUTER**

A Division of Omnicomputer Inc.

1440 Broadway • New York, NY 10018 • (212) 944-9230

SERVING NEW YORK METRO AREA SINCE 1977

#### \$50 -\$150K

#### TRADING SYSTEMS

P/A to Project Monoger - CICS/COBOL, IDMS/ADSO, DB2, ADABAS/NATURAL, Fixed Income, FX, Money Morket and Equilies. Heavy new development, Front Office/Back Office. Bonuses to 50% of salary.

#### INVESTMENT SYSTEMS

P/A to Project Monoger. SUN, UNIX/C, SYBASE, VAX · VMS/C, APL, ORACLE, WINDOWS, X.11. Develop Fixed Income, Equity and Corporote Finance Systems. BS/MS Moth or Computer Science preferred. Coll or Write to:

Jechsearch Services

1212 Ave. of the Americas New York, N.Y. 10036 (212) 302-7010

Now ... you can recruit the right people places at right the price.

With the IDG Communications Computer Ca-Netreers work, you can run the most targeted and cost-efficient recruitment program possible.

You vlamis choose the combination of six leading newspapers Computerworld, InfoWorld. Network World, Digital News, Federal Computer Week and High Tech Life-Tech Life-Styles - that's right for you.

all For the facts on putting the Computer Carers Network work for you regionally nationally call the sales ofnearest vou. Or contact John Corrigan, Classified Advertising Director, at 508-879-0700.

quick phone call can aive you all informathe tion you need on running recruityour ment advertising in up to five leading industry newspapers.

MAY 14, 1990

One

# COMPUTER PROFESSIONALS

**COAST TO COAST** 

#### IS CLOSER THAN YOU THINK

F-o-r-t-u-n-e Personnel Consultants is one of the largest national networks of independently owned and operated offices specializing in the placement of Computer Professionals in all areas including Sales and Marketing. We understand your needs and can help you find the position to enhance your career or the people to fill your company openings.

Coast-to-coast we're closer than you think. To reach our entire netowrk, write to us at 655 Third Ave., Dept. CW; New York, NY 10017 and we will forward your resume for confidential consideration or call us TOLL FREE for a specialist serving your area of interest.

1-800-221-4864 212-697-4314 in NY State

·o*-r-t-u-n-*e<sup>3</sup> Personnel Consultants

#### **Information Technology Professionals**

A major prestigious and respected global investment banking firm on Wall Street, Goldman, Sachs & Co., offers exceptional career opportunities in New York, London, and Tokyo to experienced Information Technology Professionals.

We have several immediate openings for experienced Information Technologists in Systems Development, Telecommunicatons and Technical Operations world-wide. We are also seeking professionals for our Training and Support staff roles.

We offer two state-of-the-art Systems Development environments: Our IBM mainframe environment using CO-BOL Language, DB2 and CASE Tools and our microcomputer development environment using C Language with DOS Windows, OS/2 Presentation Manager, and UNIX with MOTIF. Knowledge of brokerage is a definite plus.

We emphasize a participative environment. Your ability to work in a team environment and communicate effectively are critical success factors.

All these opportunities offer excellent salaries and benefits. To apply, please send your resume, in confidence, to: Personnel Department, RB. Goldman, Sachs & Co., 85 Broad Street, (7H/6), New York, NY 10004. We are an equal opportunity employer, M/F.

Goldman Sachs

#### DBA - Sr. P/A IBM Mainframe-MVS/XA

NPA, a leading specialist firm in the administration and control of benefit plans for Rx drugs, vision care, eligibility systems and data services, utilizes state-of-the-art systems to service our clients' diverse needs. Due to continuing growth, we are seeking candidates for two newly-created positions;

1) A skilled Data Base Administrator with a minimum of 6 months Data Base Administration experience utilizing IDMS, and (2) a Senior Programmer/Analyst with COBOL experience (will train individual with strong IDMS or CICS). Both positions require 3-10 years experience in an MVS/XA environment.

NPA offers a technically advanced environment, and outstanding professional and managerial career challenge. We have a sustained record of stability and growth, and a strong reputation for successful and innovative management. A highly competitive compensation package, including a superior benefits program, is offered. Please send resume and salary requirement, in confidence, to:

Laura A. Baron, AVP-Human Resources National Prescription Administrators, Inc. P.O. Box 2187, Clifton, NJ 07015



NATIONAL PRESCRIPTION ADMINISTRATORS INC

Equal Opportunity Employer



#### St. John's University

New York

The largest private Catholic University in the U.S. seeks qualified and motivated individuals for its administrative computing department.

#### **TECHNICAL SUPPORT ANALYST**

Aid and assist Director of Technical Services in providing computer systems software and Datacomm support for multiple campus facilities. Candidates must have 3-5 years experience in a Bull-HN

#### **PROGRAMMER ANALYST (2)**

Working with Mgr. of Systems and Programming will be responsible for enhancing and maintaining administrative systems in COBOL DMIV Bull-HN.

All positions offered require a minimum of undergraduate degree.

Forward resume and salary requirements to:

St. John's University University Administrative Computer Ctr. Queens Campus Jamaica, N.Y. 11439

St. John's University is an Equal Opportunity Employer.

#### **MAJOR FINANCIAL CONGLOMERATE**

With Worldwide Installations Needs

2 VAX Systems Programmers
DECNET a must

2 Burroughs ALGOL Application & Technical Support

1 UNIX/C/SYBASE Applications Development

**Call Bob Winns** 

#### **Exec-computer** A Division of Omnicomputer, Inc.

1440 Broadway, New York, NY 10018, (212) 944-9230 SERVING NEW YORK METRO AREA SINCE 1977

#### EXPERIENCED IN ADABAS/NATURALII?

Then you have a great luture to look lorward to with Turn-Key Solutions, a dynamic computer consulting and management company with a long and distinguished list of clients.

The continually growing demand for our expert services, has created long- and short-term Assignments and Opportunities throughout the country. Flexible hours are available. Degree preferred, but we will consider comparable experience

We oller an excellent, highly competitive compensation and benefits package. For prompt consideration, please lorward your resume to or call:

TURN-KEY SOLUTIONS, INC. 15 Malden Lane, Suite 805 New York, N.Y. 10038 FAX: 212-619-5047

An Equal Opportunity Employer M/F
(Sponsorship Available)

Turn-Key Solutions, Inc.

#### **CONSULTING OPPORTUNITIES**

**Branch Managers, Sales, Recruiters** 

5 year old regional information technology company is planning rapid expansion via merger, acquisition and/or new branch start up. Seeking highly motivated entrepreneurial individuals to join fast growing team. Current locations: N.Y., Ohio, Florida and Virginia.

Principals/Experienced Computer Consulting Industry inquiries ONLY.

James P. Growney, President C.P.U. Incorporated 345 Woodcliff Drive Fairport, NY 14450

FAX: 716-385-7918 OFC: 716-385-7710



An Information Technology Company

# COMPUTER SPECIALISTS ...OUR ONLY SPECIALTY

Experienced in Engrig or Programming? We match you to the job you want All USA Localions/All fees paid Mail resume or call to discuss your career goals

TECH SUPPORT IBM & DEC SOFTWARE

PROG/ANALYSTS
IBM M Frame & Minis CICS RPG COBOL Databases

HARDWARE COMMUNICATIONS

HAMILTON

P.O. Box 369 West Hurley, N.Y. 12491 (914) 679-4050

#### RECRUIT ONLY THE BEST!

Place your ad in regional or national editions of Computerworld's Computer Careers section. For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

#### COMPUTER CAREERS EAST

#### TECHNICAL **ANALYST**

Responsibilities include monitor-Hesponsibilities include monitor-ing equip, capacity and utilization and aiding Technical Support Ser-vices in evaluating the need for equip, upgrades and configuraequip. upgrades and configuration changes; exposure to capacity planning and DASD management is desired. The ability to analyze, determine and solve technical problems encountered in daily operation of the data center is required. Requires exp. in large IBM Mainframe environment including MVS, SAS, COBOL, CICS, DMS or DFHSM, NCP, NCCF, TSO, and OMEGAMON. Salary to \$40K. Contact JIM BOSTIC, PHILLIPS RESOURCE GROUP, P.O. Box 5864, Greenville, SC 29606 or call 803/271-6350 (D), 803/292-1181 (E), or 803/271-8499 (FAX).

#### **COMPUTER PROFESSIONALS**

Progressive and growing leader in the software services industry has current needs for full time and contract consulting staff in N.C., S.C., and Florida. Excellent salary and benefits package including medical, dental, life coverage, and incentive bonus. Positions require two or more years experience in any of the following areas:

- COBOL, CICS, TSO
- IMS DB/DC
- ADABAS/NATURAL
- VAX, INGRES
- APPL/FACTORY
- HOGAN, BANKING
- . Mc & DODGE
- IDMS/ADSO • CICS, MVS/XA
- VAX. ORACLE • VAX. RDB
- CREDIT CARD • HP-3000, IMAGE
- IBM AS/400 POWERHOUSE Send resume in complete confidence to:

SOFTWARE Data Services, Inc.

4651 Charlotte Park Drive, Suite 100 Charlotte, N.C. 28217

#### H/W & S/W ENGINEERS PROGRAMMER/ANALYST SYSTEMS PROGRAMMERS TECH WRITERS

- OS2, Present. Mgr.
- IBM PS2, "C", INTEL
- UNIX/AIX INTERNALS • PROGRESS, UNIX
- APL, MARKETING
- ORACLE/INFORMIX
- RAMIS/FOCUS • CLIPPER/UNIX
- AS/400 COBOL or RPG
   MOD 204
- ADA w/ MIL STND 2167A CICS/IMS DB/DC

4401 W. Tradewinds Ave #303 Ft. Lauderdale, FL 33308 (305) 776-5300 The Experts Fax (305) 776-6328

JD EDWARDS

• REXX/EXEC2

• DB2 w/ CSP

• INGRES DBA

• M&D Millennium

• Nuclear S/W Tech Writer

• DB2 Architect w/CICS

· SQL/DS w/ ISPF Intern.

"It takes one to know one"

University of Alaska, Statewide Administration **University of Alaska Computer Network** (UACN), Fairbanks

POSITION: Production Control Technician III, FULL-TIME PERMANENT SALARY: D.O.E. plus excellent benefits (relocation expenses

CLOSING DATE: June 15, 1990

JOB SUMMARY: Schedule/setup and monitor data processing for the University of Alaska's test, quality assurance and production administrative applications. Maintain production/operations software packages.

MINIMUM QUALIFICATIONS: At least 3 years knowledge of batch systems, production control and operations environments, job control language, general computer concepts and terminology, file handling, data security, text editing, and utilities. Experience with CA7 Automated Production Control software and CA1 tape management system software pre-

TO APPLY: Submit a current resume and the name of three references

University of Alaska Computer Network John Butrovich Bldg. 910 Yukon Drive, Suite 208C Fairbanks, AK 99775-5180 ATTN: VI Mullen

THE UNIVERSITY OF ALASKA IS AN EO/AA EMPLOYER AND EDUCATIONAL INSTITUTION PERSONS HIRED BY THE UNIVERSITY OF ALASKA MUST COMPLY WITH PROVISIONS OF THE FEDERAL IMMIGRATION AND CONTROL ACT OF 1986 AND ARE EXPECTED TO POSSESS A VALID SOCIAL SECURITY NUMBER.

MAY 14, 1990

#### PROGRAMMER/ANALYSTS

CENTRAL FIDELITY, Virginia's best bank with \$5.3+ billion in assets, over 185 banking offices, and more than 3,000 employees, has openings for experienced programmer/analysts. Successful candidates will demonstrate a strong COBOL programming background in an IBM 30XX-MVS XA environment along with the requirements shown below:

#### SENIOR SYSTEMS PROGRAMMER/ ANALYST FOR ATM SYSTEM

- Minimum five years ATM processing experience with at least two years SFS's ON/2 software, Stratus hardware/VOS, and

#### SYSTEMS PROGRAMMER/ANALYST -**COMMERCIAL LOANS**

- Minimum two years bank experience with M&I (or comparable) loan software, IMS DB/DC, and VSAM.

#### PROGRAMMER/ANALYST

- Minimum two years banking experience, SSI's PEP+ or other ACH software, IMS DB/DC, and VSAM.

Central Fidelity offers competitive salaries and benefits amidst the beauty of the Central Virginia countryside. To join the Vir-ginia-only bank with fifteen consecutive years of eamings growth, submit resume to:

CENTRAL FIDELITY HUMAN RESOURCES P.O. Box 700 Lynchburg, VA 24505 or call (804) 847-9348

Equal Opportunity Employer



#### PROGRAMMERS AND ANALYSTS

(Rhode Island and Upstate N.Y.)

#### \*PROJECT MANAGER \*PROJECT LEADERS \*PROGRAMMERS - Jr. to Sr.

Outstanding opportunities with top financial services company in Northeast, working with leading edge systems.

If you're looking for a challenging position where performance and commitment to timetables are valued, contact us immediately!

COBOL required, working off IBM & DEC. Financial services industry background a plus. Locations in Rhode Island & Upstate New York. Send Resume, Fax or Call:

> **Bill Marlow Straube Associates** 2 Elm Square Andover, MA 01810

Tel: (508) 475-2020 Fax: (508) 470-0499

#### BENSON, DOUGLAS, & ASSOCIATES

#### **Computer Professionals**

Our business continues to grow. Currently operating in five states on the east coast, we are still expanding. With two or more years experience in any of the following disciplines, you may qualify for more than just a coding assignment.

- BM/CICS, VSAM, DB2, COBOL

  VAX/Object Oriented C++, AI

  HP3000, 9000, COBOL, POWERHOUSE, Etc.

  BASIC FOUR IDOL MANBASE, ORDER ENTRY

  UNIX ALL PLATFORMS

  OA/SOFTWARE TESTING, TEST SCRIPTS, TEST PLANS (MANUAL)

  PC/MS-DOS, UNIX/C, LANS & WANS (OPTICAL DISK)

  REMITTANCE PROCESSING PASCAL, TRPL, RAPS

We encourage growth with challenging, authoritative assignments. For immediate consideration, please call Jim Hash at (919) 467-3357 or (800) 525-2927. Or send resume to: BD&A, 113 Edinburgh So, Suite 104, Cery, NC 27511, ATTN: Jim Hesh

#### THE CONTRACTS ARE IN!

Major clients have just listed several openings with us. These are Real Time openings' with IMMEDIATE INTERVIEWS for qualified candidates. Position equire 2-10 years strong technical experience

We are dealing directly with hiring managers for these key openings. Companies provide top benefits, advancement and excellent working environment

To \$60K To \$60K To \$55K

To \$55K

- SYSTEMS/DBA's (DB2, IMS, Adabas, FDCUS)
   PRDDUCT SPECIALISTS (DB2, TELDN, IEF, IMS)
   APPLICATIONS/DBA's (DB2, IMS, Adabas, FDCUS)
   W2 CDNSULTANTS (DB2, IMS, TELDN, APL, FDCUS)
   P/A's (CDBDL, CICS, JCL)
   PRDJECT LEADERS (IBM, CDBDL)
   DASN PRDD SPECIALISTS

- ALC SPECIALISTS

For immediate consideration, call Mon-Fri, 573-0200 (24 hr answering).

Fax/24 hr (703) 573-3612

**BILL YOUNG & ASSOCIATES** 

8550 Arlington Blvd. (Suite 202), Fairfax, VA 22031

#### ATTENTION CONTRACTORS, SYSTEMS AND PROGRAMMING PROFESSIONALS

Long term contracts available for candidates with at least two (2) years experience in the following:

- ORACLE \* INGRES
- \* DB2, NATURAL
- \* DEC, COBOL
- \* INFORMIX \* UNIX, C

Please Send Resume in Confidence to:

DP PROS INC. P.O. Box 2229 • Burlington, NC 27216

Phone: (919) 222-8030 (919) 227-6274 (FAX)

#### A Terrific **ANALYST** Opportunity

est growing contract pro-gramming and consulting firms, has immediate open-ings for talented Programmer-/Analysts with 2 or more years experience Excellent salary & benefits package We're especially seeking

NATURAL/AOABAS CICS/COBOL IMS OB/OC IOMS/ADSO TECH. WRITERS LIFECOM SYS. PROGRAMMER VAX/FORTRAN/COBOL PL-1/COBOL VAX/C/INGRES AS400/COBOL

#### Computer Consulting Group

IOEAL/DATACOM

Contract Professional Services

Research Triangle Area

4109 Wake Forest Rd Suite 307 Raleigh, NC 27609 1-800-222-1273 (803) 738-1994 FAX (803) 738-9123

#### **BRANCH MANAGER** Make the

Difference!

Put your proven sales, profit & loss and information service knowledge to the test as a Branch Manager for our multi-nadata processing tional consulting organization. Positions will be based within the Mid-Atlantic and Southeastern regions. As a leader in the information services industry, we seek talented individuals ready to make the difference as part of a team committed to providing the highest quality service available to our diversified range of clients.

If qualified, please submit your resume and salary history in confidence to:

Dept. Branch Manager 900 Ashwood Pkwy. Suite 230 Atlanta, GA 30338

EOE

#### CONSULTANTS

Professional integrity and honesty, both to the client and the consultant, are our most important concems. As proof of this, we:

- 1. Tell you the bill rate; 2. Pay a high % of the bill rate; 3. Tell you our profit.
- We need people with a minimum of 1+ years practical experience in the following:

VAX VMS, C or UNIX/C; Fortran, COBOL, Oracle, RDB

COBOL, IDMS DB/DC, CICS, DB2; COBOL, Mantis or IDMS/ADSO, PL/1, IMS DB/DC, CICS; COBOL or RPG III - Sys 38/AS 400

#### J M Ross & Assoc., Inc.

P.O. Box 1724, St. Louis, MO 63043-0621 (314) 434-1976/ FAX (314) 434-0952 NACCB Member

SYSTEMS ENGINEER: Will ana-SYSTEMS ENGINEER: Will analyze, review & determine ideal data-processing systems & peripherals for transactional banking automation system using SNA interoperability channel-attached gateways & IBM-MVS System 370 mainframe, & 3 COM ROUTERS & LAN/WAN architecture; determine & actabilish Ideal systems canabilish Ideal systems canabilish LAN/WAN architecture; determine & establish ideal systems capabilities required for banking projects & workloads; liaison with banking staff and technical personnel on modifications and/or new systems installation; analyze data to determine recommendations/solutions to computer network deficiencies; determine & recommendations/solutions to computer network deficiencies;

to computer network deficiencies; determine & recommend any computer equipment/systems for implementation in bank operations. Requirements: BS degree in Computer Science or Electronic Engineering; 6 months exp. in above; 40 hrs./wk. 9:00-5:00 schedule. Salary: \$32,000/yr. Interested applicants send resume to Job Service of Florida, ATTN: Job Order #FL 0277554, 105 E. Broward Blvd., Ft. Lauderdale, FL 33301.

#### PROGRAMMER

Systems

**Professionals** 

North Carolina

Locations

Permonent and Contract

• OS2 . DEC VÁX

. MS Windows

Positions-Two or more

Dotocom • INGRES

• Networking • DBAs

5000 Folls of the Neuse

Toll-Free: (800) 832-3443

ntelligence,

**RESEARCH TRIANGLE** 

**OPPORTUNITIES** 

ASSEMBLER, C, UNIX
BIM COBOL or CICS
DEC VAX Software
TANDEM/TAL
HOGAN or MSA
LAN ANALYST
DIDMS/ADS/O or IMS
AS 400/Syst. 38
INGRES or ORACLE
ADABAS/NATURAL
Banking/Financial

Banking/Financial DEC VAX Systems Mgrs MVS, DOS or VTAM Sys

Vulcraft, a division of Nucor Corp., a Fortune 500 Company,

and the nations largest supplie

of steel bar joists, is looking for an ambitious programmer to

join our growing team. Successful candidate will work closely

with our engineers and managi

ers in supporting our design software and working on spe-cial projects (including Prime to DEC conversion). We are a sol-id, employee oriented company

offering excellent benefits and

pleasant rural location just 20 miles northeast of Ft. Wayne,

Indiana. If you have a working knowledge of Fortran and VAX/VMS, forward your qualifi-

cations to Bill Sherwood, Vul-craft, P.O. Box 1000, St. Joe,

THE

COMPUTER

CONNECTION

WE NOW HAVE FORTUNE 500

COMPANIES SEEKING: P/A'S COBOL/CICS/IMS . TO 35K S/A'S COBOL/CICS/IMS . TO 45K SYS. PROG. CICS . . . . TO 45K SYS. PROG. MVS . . . . . TO 45K

SEND RESUMES TO OR CALL:

THE COMPUTER

CONNECTION

P.O. BOX 824 GRAHAM, NC 27253 ATTN: SHERRY RAMSEY

919-227-5806

ANALYST -- Medical systems applications. Requires M.S. in computer science and a minimum of

months experience in

systems analysis and programming using "C" language with SQL databas-

es, along with telecommunications interfaces. Sal:

\$29,700/yr. Apply Georgia Dept. of Labor, 1535 Atkin-

son Road, Lawrenceville, Georgia 30243, or to the nearest Georgia Job Ser-vice Center. Control #GA

5425752.

IN 46785. EOE M/F/H

ncorporated

Rood, Dept. C, Raleigh,

FAX: (919) 876-2127

Computer

yeors' experience.

• DB2

• ORACLE

· COBOL

EOE

- \* HP-3000, COBOL
- DB2
- \* CICS
- \* OS2, Pres. Mngr.,
- MS-WINDOWS \* CSP
- \* Software Developers If you have two years

of experience in any of these skill areas,

We Need You Now!

METRO is an Information Technology services consulting firm in its 10th successful year, with 364% growth over the last five years. We offer outstanding opportunities and benefits to Staff Members.

#### METRO Information Services, Inc.

Send resume to or call: Joy Hood, Dept. CW Carolina Place, Suite 550 2626 Glenwood Avenue Raleigh, North Carolina 27608-1004 Office (919)783-8887 Fax (919) 783-9305 EOE

● DB2 or IMS DBA SYSTEMS ANALYST/PRO-GRAMMER. Provide specialized consulting services on location to Permanent / Fee Paid Local - Regional - National design develop and analyze system application software for state The Underwood Group, Inc. 3924 Browning Pl., Suite 7 Raieigh, NC 27609 (919) 782-3024 FAX (919) 783-0492 of the art large mainframe IBM and Unisys (Burroughs) comput-ers using COBOL, PASCAL, C, FORTRAN languages Knowl-edge of Item Processing Systems VAX/VMS - Fortran

(IPS), document processing utiliz-ing DP 1800 computers, Global Financial Systems (GFS), Linc, Unix, Compiler constructions and data communications interfaces. data communications interfaces.

Requirements: B.S. Engineering or Computer Science, 2 years experience in above. Out of the 2 years of experience candidate. years of experience candidate must be thoroughly familiar with Unisys (Burroughs) computer equipment V series, B3900 and B6900, COBOL, IPS, gained through at least 1 year experience. 40 hrs/wk 9-5:00; \$34,000/yr. Interested applicants send resume or apply in person to: Georgia Dept of Labor, 1275

PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

Clarendon Avenue, Avondale Estates, GA 30002, or to the nearest Georgia Job Service Center. Control #GA 5424033.

#### FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/A's as well as systems programmers and DBA's Fee Paid Please call or send resume to

Keith Reichle, CPC Systems Search, Inc. 203 Heritage Park Lake Wylie, SC 29710 803/831-2129

(Local to Charlotte, NC)

#### DALLAS & HOUSTON CONTRACT **POSITIONS**

- ORACLE/VAX
- AS/400 RPG III
- ADABAS/NATURAL

#### ECOM

Phone 214-869-7603 Fax 214-869-7748 Phone 713-686-9740 Fax 713-686-9454

#### **CONSULTANTS** CONTRACTORS

Need experienced; COBOL, CICS, IMS, DB2, DB/DC, FOCUS, TSO/ISPF, VM/CMS, 'C', RPGIII, MSA, PC Nets, others.

> Entry level!! APL Avail. today. Call

> 1-800-752-8296 **CWSSYSTEMS** P.O. Box 10444 Atlanta, GA 30319

#### COMPUTER PROGRESS UNITED \$40,000 to \$60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for P/A in Kentucky, Ohio, Indiana, and Tennessee. We ere the DB2 Specialist! DB2/SQL

IMS = CICS Send resume or call:

omputer Progress United 12730 Townepark Way Louisville, KY 40243 (502) 245-6533

#### Now you can recruit the right people in the right places at the right price

It's the IDG Communications Computer Careers Network, and it lets you run the most targeted and costefficient recruitment program possi-

Its many options help you recruit qualified computer and communications professionals - regionally or nationally - with combination buys of up to five leading newspapers. And all together, the Computer Careers Network delivers your message to an audience of well over 1 million qualified computer professionals.

#### Look at what the Computer Careers Network lets you do:

Customize your recruitment program. The Network's five newspapers - Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week - let you tailor your recruitment program to your specific needs. You can buy as many as five newspapers with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nátionally. Plus - you can still take advantage of stand-alone national rates for individual newspa-

Reach qualified professionals cost efficiently. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network lets you buy the combination of newspapers that will deliver your recruitment message to qualified computer and communications professionals - and only those qualified professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you, or contact John Corrigan, Classified Advertising Director, at 508-879-0700 ext 676.

One quick phone call can give you all the information you need to run your recruitment advertising in up to five leading industry newspapers.

MAY 14, 1990 114 **COMPUTERWORLD** 

# Pull Your Own Strings

In today's world of mergers and buyouts, your future with a company can be uncertain. You owe it to yourself to take charge of your career and pull your own strings.

TECH FAIR® offers an excellent opportunity for engineers and computer systems professionals to meet face to face with high technology companies who can show you what's available in today's high tech career marketplace.

At TECH FAIR, you can find out your worth, explore new career possibilities and get a closer look at projects and position openings all in an informal, no préssure atmosphere.

So, come to TECH FAIR and pull some strings of

There's a TECH FAIR coming to your area soon.

#### MAY TECH FAIRS

May 7 Stouffer Orlando Resort, Orlando, FL May 8

Holiday Inn Oceanfront, Melbourne, FL

Burlington Marriott, Burlington, MA May 23

Guest Quarters Suite Hotel, Waltham, MA

**Show Hours 3PM-8PM Free Admission** 

Sponsored by BPI, 2985 Multifloods Tower, 33 South Sixth Street, Minneapolis, MN 55402

#### D. P. PROFESSIONALS

# ETAHEAL

Keane is clearly out in front. Our stock increased its value 218% last year. Forbes Magazine rated us one of America's best small companies. We've expanded into new territories, thanks to aggressive acquisition strategies. And our computer software consulting services are in demand from select Fortune 1000 manufacturers, major financial and insurance companies, service companies and government agencies. If you're a professional ready to get ahead, get in touch with Keane.

#### **PROGRAMMERS** PROGRAMMER ANALYSTS

We have 20 offices from Maine to Florida and throughout the Midwest. If you're a computer software programmer with 2-5 years' experience in one or more of the following areas, we want

> **IMS AS 400 ADABAS ASSEMBLER CICS**

COBOL PL/1SYSTEM 38 **IDMS SMARTSTAR**  **TELON FOCUS** 

Keane offers all employees an opportunity to grow with the leading project-oriented computer software consulting company in the US; superb technical, management and project management training. Competitive salaries, comprehensive benefits including life and health insurance, 401 K Plan, tuition reimbursement, and vacation condominiums. For more information, call Greg Alleyne at 1-800-899-5326; or send your resume to Keane Inc., 36 So. Charles St., Suite 2350, Baltimore, MD 21201. An equal opportunity employer.



#### SUNQUEST. SOFTWARE **Development Opportunities**

SUNQUEST INFORMATION SYSTEMS, INC., an industry leader in providing healthcare information systems, has challenging opportunities available for:

\* Programmer \* Programmer Analyst \* Systems Analyst

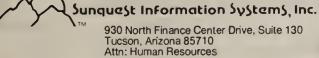
These positions will be part of our ongoing software development efforts in a variety of product and service areas including:

- \* General Clinical Lab
- Software Installations
- \* Blood Bank Transfusion
- \* Billing Interfacing \* Radiology
- \* Microbiology
- **Blood Bank Donor**
- \* RDBMS
- Billing/Accounts Receivable

Experience in a clinical lab, hospital, or a related healthcare environment and experience in developing/maintaining large scale ANSI, MUMPS data base applications is desired.

By joining SUNQUEST, you will be involved in a company that will have a major impact in defining the uses of Information Science for the practice of medicine in the 21st Century.

If you wish to be considered for any of these positions, please forward your resume including salary history to:



SUNQUEST - Merging the Miracle of Medicine and the Magic of Information Science!

An Equal Opportunity Employer

#### MIS **DIRECTORS**

If you need good people, we've got them. Computerworld reaches more than 612,000 computer professionals every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 508-879-MA, 0700).

Computerworld Weekly, Regional, National. And it Works. Computer

## We Need Engineering And Scientific Technical Professionals

CSC's Special Projects Division has been selected as a team member with the University of Minnesota to contribute to advances in state-ofthe-art high performance computing. We are currently seeking "high performers" to fill several current openings in Vicksburg, MS; Warren, MI and Aberdeen, MD.

- SENIOR CONSULTANTS (MS or PhD) to support scientists and neers using Finite Element Method codes such as NISA, PATRAN, ABAQUS, ANSYS, etc., and related applications in Cray, minisuper, and graphic workstation environments. Knowledge of composite materials in Finite Element Methods is a plus.
- ADDITIONAL POSITIONS (BS/MS) are available to support simulation of mechanical systems, application of emerging computational methods, codes optimization, application of visualization techniques, or usage of standard mathematical libraries.

To meet the challenges of this program, the successful candidates should have experience in supporting researchers resolving today's computational problems and addressing those of the future.

If you have skills in these application areas or directly related user support experience on Cray systems, and/or graphics workstation environments, CSC has a challenging, rewarding opportunity for you.

Send your resume to CSC, Special Projects Division, Attn: Al Drake, Human Resources Department, 3160A Fairview Park Drive, Mail Code 321, Falls Church, VA 22042, or call (703) 876-1044. An equal opportunity



**Computer Sciences Corporation** 



#### Computer Employers **Expect NCA To Be The Most Effective In Meeting Their** Personnel Needs... and we earn their approval every day!

For many years now, many thousands of EDP employers have relied on NCA firms to meet their staffing needs... efficiently and professionally. As a result, you can be sure that we constantly make intensive efforts to provide the experienced and qualified people needed...far more than you could find elsewhere.

To those employers who have not yet enjoyed the advantages of working with us...check us out with those employers who have. They'll assure you that our services are excellent, our candidate resources are impressive, and our consultants have superior professional expertise.

Whether your staffing needs are local or national, contact the NCA firm nearest to you. We'll thank you now... and you'll thank us later.



ATLANTA: DataPro Personnel Consultants 1050 Crown Pointe Pkwy, Suite 430 Atlanta, GA 30338 (404) 392-9990 BOSTON: Robert Kleven & Co., Inc P.O. Box 536 Lexington, MA 02173 (617) 861-1020 CHICAGO: Thomas Hirtz & Associates 150 North Wacker Drive, Suite 1700 Chicago, IL 60606 (312) 977-1555 CINCINNATE Task Group 7875 Reading Road Cincinnati, OH 45237 (513) 821-8275 CLEVELAND: Innovative Resources, Inc CleveLAND: Innovative Resources, Inc. Statler Office Tower, Suite 426 1127 Euclid Avenue Ckeveland, 0H 44115 (216) 621-4220 Cleveland, 0H 44115 (216) 621-4220
COLUMBUS: Michael Thomas, Inc.
450 W Wilson Bridge Road, Suite 340
Worthington, 0H 43085 (614) 846-9926
DALLAS: DataPro Personnel Consultants, Inc.
13355 Noel Road, Suite 2001
Dallas, TX 75240 (214) 661-8600
DENVER: Abacus Consultants, Inc.
1777 South Harrison Street, Suite 404
Denver, C0 80210 (303) 759-5064
DETROIT: Electronic Systems Personnel
3000 Town Center, Suite 2580
GREENSBORD: DataMasters
PO Box 14548
Greensboro, NC 27415-4548
[919] 373-1461
HARTFORD: Compass, Inc. (919) 373-1461
HARTFORD: Compass, Inc.
875 Asylum Avenue
Hartrord: CT 06105 (203) 549-4240
HOUSTON: Career Consultants, Inc.
1990 Post Oak Boulevard, Suite 1050
Houston, TX 77056 (713) 626-4100
KANSAS CTYT: DP Career Associates
6405 Metcalf, Suite 502
Shawnee Mission, KS 66202 (913) 236-8288
LOS ANGELES: Superior Resources, Inc
22653 Pacific Coast Highway, Suite 1-106
Malibu, CA 90265 (818) 884-3000
MIAMI: Data Sciences Personnel, Inc. MIAMI: Data Sciences Personnel, Inc. MIAMI: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, F.L 33084 (305) 434-6112
MILWAUKEE: EDP Consultants, Inc
Chancellory Part II, Suite 350
350 N Sunnyslope Road
Brookrield, WI 5300 (414) 797-8855
MNPLS./ST. PAUL: Electronic Systems Personnel
880 International Centre
900 2nd Avenue South
Minneapolis, MN 55402 (612) 338-6714 880 International Centre
900 2nd Avenue Sourth
Minneapolis, MN 55402 (612) 338-6714
MEW JERSEY: Systems Search
2040 Millburn Avenue
Mablewood, NJ 07040 (201) 761-4400
NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, NY 10007 (212) 227-7370
PHILADELPHIA: Systems Personnel, Inc
115 Wes State Street
Media, PA 19063 (215) 565-8880
PHOENIX: Professional Career Consultants
4725 North Scottsdale Road, Suite 209
Scottsdale, AZ 85251 (602) 274-6666
PHTSBURG: KOS Computer Services, Inc
400 Penn Center Brid Suite 320
Monroeville, PA 15235 (412) 823-8632
ROCHESTER: Traynor Confidential Ltd.
10 Gibbs Street, Suite 400
Schaster, NY 14604 (716) 325-6610
SAN DIEGO: Technical Directions Inc
8880 Rio San Diego Dr. Suite 1025
San Diego CA 92108 (619) 297-5611
SAN FRANCISCO: Professionals for Computing,
455 Market Street, Suite 1850
San Francisco, CA 94111 (415) 957-1400
SEATTLE: Houser, Martin, Morns & Associates
110 110th Avenue N E. C. 90015
Believue: WA 98009 (206) 453-2700
STANFORD: Higo Waters Professional Recruiting
707 Summer Street
Stamford, CT 06901 (203) 357-8400
ST. LOUISE: Executive Career Conscription

707 Summer Street
Stamford, CT 06901 (203) 357-8400
ST. LOUIS: Executive Career Consult:
795 Office Parkway, Suite 100-CW
St. Louis, M0 63141 (314) 994-3737
SYRACUSE: The CFA Group Inc.
EXPON Midwards Parkway

Gulfstream Aerospace Corporation is currently seeking quali-

SENIOR OPERATING

SYSTEMS ANALYST

Our Senior Systems Programmers provide internal consulting and

highly specialized technical knowledge and experience to the process

of designing, implementing, administering, measuring, tuning, and maintaining complex computer hardware and software configurations.

Qualified applicants should possess a Bachelor's degree in Computer

Science or equivalent experience, with a minimum of six years Data Pro-

cessing experience, to include four years of Systems Programming on

MVS/XA operating systems. Should also be proficient with the use of SMP/E, JES 2, DFP/XA, TSO/ISPF, RMF, and S/370 Assembler. Experience with UCC 1, UCC 7, UCC 11, DF/HSM, and DASD tuning helpful.

DATA BASE ANALYST

Our DBA's design, implement, and maintain data bases; perform data

base design, data base generation and coding, data base recovery and

Qualified applicants should possess a Bachelor's degree in Computer

Science or equivalent experience with a minimum of three years IDMS

data base experience including at least one year of DBA experience with

IDMS physical data base design and navigation. Background in the environmental and administrative support for CAS manufacturing and

Gulfstream Aerospace Corporation is the world's leading manufacturer

of corporate executive jet aircraft. We are located in Savannah, Georgia, which is home to this country's single largest historic district. Savan-

nah is a beautiful city located just minutes from beaches on the Atlan-

tic Ocean. If you meet our requirements and would like the opportunity

to work with a company that is committed to quality, please indicate you are responding to Ad #90-15 and send your resume and salary history

Gulfstream

Aerospace

restart, and application programmer support

financial application modules is highly desirable.

Instructional Designer 3 to ensure the definition, design, and devel-opment of stretegies and techniques for generic, product specific, and job specific instructional and informational material. Assists clients in the development of clients in the development of highly complex courses and informetional meterial using text based, computer based, and multimedia techniques. Plans and manages instructional development projects. Conducts job, needs, tesk, expertise, and eudlence enelysis, es well es formetive and summetive evaluation plans. needs, tesk, expertise, and eudience enelysis, se well es formetive
and summetive evaluation plans.
Develops valid and reliable date
collection instruments, conducts
interviews and surveys, analyzes
and synthesizes dete using quanittetive and qualitetive methodology. Designs curriculum. Uses e vanety of opereting systems including VAX/VMS, develops and
teaches workshops related to instructional technology. Develops
instructional and statistical software. Requirements are e Ph.D. in
Instructional Systems Technology
with an emphasis in instructional
design end minors in research
methodology end computer science. Demonstrated ability in process consultation, working collaboratively with clients to develop
courses and instructional materials; in job, needs, task, expertise,
and eudience analysis and formative and summative evaluetions; in
design of instruction in e variety of
formats, including text-based,
computer-based and multimedia;
in plenning and maneging instructionel development projects; in computer-based and multimedia; in plenning and maneging Instructionel development projects; in curriculum design; in developing and teaching workshops related to instructional technology; in overcoming resistance to innovative instructional techniques and bringing ebout change is required. Strong research skills in quantitative and qualitative methodology, including developing valid and reliable data collection instruments, conducting interviews and surbble data collection instruments, conducting interviews and surveys, and analyzing data are required. Demonstrated ability using a variety of operating systems including VAX/VMS and developing instructional and statistical software is required. Salary: \$41,700.00 to \$45,000.00 per year. 40 hpw, no exp. req. If you ere interested in, and qualified for the above position, please forward your resume to: State of N.H., Department of Employment Security, 32 South Mein Street, Concord, N.H. 03301-4857 JOB ORDER NO. #90-73.



Contractors & Full Time DB2, CICS, VSAM, IDMS IMS, CSP, ESA

- Data Base Managers Director Data Center
- Data Security Analysts
- (RACF)
   Project Managers
- Programmer Analysts
- Systems Programmers Systems Analysts
- Data Base Analysts

Free 1990 salary survey available. Send resume.

Chuck Klein & Assoc. 3840 Thorson Dr. Placerville, CA 95667 (916) 644-6396

APPLICATION PROGRAM ANA-LYST. Position required to design, develop and implement complex computer system enhancements using specific linear programming and statistical techniques. Position involves design and analysis of methematical or simulation techniques specific to an actuanal application computer software system (as regulated by the Government of Taiwan). Position elso requires systems analysis, testing, and documentation skills specific to the requirements of a projection to the requirements of a projection system. Position requires e Bechelor of Science degree in computer science with edditional coursework in ectuarial science consisting of e minimum of three courses. Must be experienced in the COBOL computer language and be fluent in spoken and writern Chinese language. 40 hours and be fluent in spoken and written Chinese language. 40 hours per week, 8:00 a.m. to 5:00 p.m., compensation of \$27,500 per year. Send resume with social security number to Indiana State Employment & Training Services, 10 North Senate Ave., Indianapolis, IN 46204, Attn: W.F. Shepherd. Include ID No. 3180488 with response. **Programmer Analysts** 

West One Bancorp, a multi-state financial services holding company, headquartered in Boise, Idaho, is seeking experienced Programmer Analysts for the Consumer/Commercial Loan and Disc IRS/LCR Systems teams.

Most qualified candidates will possess:

- Bachelor's degree in Computer Science or related field, or equivalent programming experience.
- 3-5 years' experience in large-scale IBM MVS or ESA environments.
- Proficiency in COBOL, VSAM, CICS and OS/JCL.
- Familiarity with IMS Database, DB2 Database, ROSCOE, TSO/ISPF, Librarian, VSAM Assist and Project Life Cycle Methodology.

Boise, Idaho's beautiful capital city has so much to offer and unlimited recreational opportunities: day/night skiing at Bogus Basin (30 minutes from downtown), backpacking, hunting, fishing, biking, wind surfing, river rafting, water skiing, camping and jogging along the 9-mile Boise River Greenbelt.

Don't miss your chance for an exciting career with a growing company and a taste of Boise's good life!

Send your resume and salary history to: Mary Ockerse (3-2255), P.O. Box 8247, Boise, ID 83733. An equal opportunity employer M/F/H/V.

**YEST ONE BANCORP** 

#### Advance to AS/400 at Synon.

SYNON is the leading supplier of Computer Aided Software Engineering (CASE) tools for the AS/400. In a little over 2 years, we have over 500 customers in North America alone! IBM recognizes the value of our products and has included SYNON as part of AD/CYCLE, their development blueprint for the future.

#### **Application Consultants**

Learn AS/400, Synon and CASE techniques. Demonstrate our products, assist during customer evaluation and implementation. Some travel required. Aggressive compensation package leveraged on sales team performance. CPF, OS/400, Big 6 consulting and/or CASE experience required. Openings in New York City, D.C., Chicago, Dallas, and San Francisco Areas.

SYNON provides a complete company paid benefits package. Relocation reimbursement will be considered for the right candidate. Please respond with salary history and resume to: SYNON, INC., Personnel, 1100 Larkspur Landing Circle, Larkspur, CA 94939. Principals only please. EOE

1 S SV

ANALYSTS • PROGRAMMERS • HW/SW

#### In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will among our 1000+ client companies and 200+ affiliates nationwide, within 24 hours efter we receive it. No cost or obligation to you; no sales pressure.

clients seek 2 years minimum professional experience, stable work history, good technical references, and U.S. citizenship or green card.

TO APPLY: Mell or FAX resume or call Howard Levin.

RSVP SERVICES

Dept. C. Suite 614. Dne Cherry Hill Mall, Cherry Hill, NJ 08002

800-222-0153 or FAX: 609-667-2606 (refer to Dept. C)

MAINE - NH \$25,000 - 50,000 Salary

ROMAC, the largest and oldest placement agency in this area, is seeking qualified data processing roiessionais v requirments in the \$25,000-\$50,000 range. Our clients pay our fees.

#### 354 ROMAC.

Att: Dept. 2 P.O. Box 7040DTS Portland, ME 04112 (207) 773-4749 FAX (207) 773-2645



#### IT'S CALLED THE GOLDEN GATE FOR GOOD REASON

System professionals can discover career enrichment, personal satisfaction and rewarding employment with our prestigious clients. Sophisticated technologies include Mainframes, Minis, Micros, PC's, Networks, Communications, System Software, Data Bases, 4-GL's, design, development and software engineering.

THE SEARCH FIRM, INC. 595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105 (415) 777-3900 FAX 777-8632



Jr to Sr level programmers with 1+ yrs exp in IBM, "C." PL-1. ASSEMBLER, & other high-level languages Con-tract assignments 12-18 mos + \$24-28/Hr + per diem +

CONTACT: AI Madsen, C.E.C.
CORPORATE PERSONNEL
CONSULTANTS, INC.
3705 Latrobe Drive. Suite 31D
Charlotte. NC 28211
(704) 366-1800
FAX (704) 366-007D

An Equal Opportunity Employer M/F/H/V

Savannah, GA 31402-2206

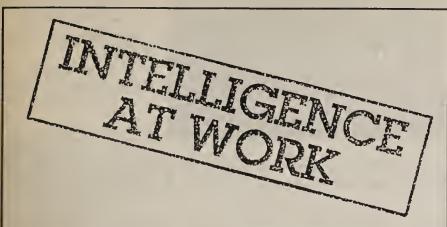
P.O. Box 2206, M/S D-03

**GULFSTREAM AEROSPACE** 

in confidence to:

CORPORATION

116



#### At DSC Communications, intelligent networks start with intelligent people.

ven with our sophisticated technology, people play the leading role in DSC's success. Part of these accomplishments include the development of one of the first software programmable cross connect systems, and one of the largest Signal Transfer Points (STP) for use within the long distance and local exchange networks. These are just a few of the many complex systems our more than 3400 employees have created.

People make us different. If you're looking for a place to start a different sort of technical career, check our list of current openings.

#### Software Engineers

**Operating Systems** On-Line Maintenance/ Configuration On-Line Diagnostics & Fault Isolation Man-Machine Interface

Software Tools/Languages System Integration and Test **Network Control Systems** PC-MS/DOS MS\*Windows

**Objected Oriented** Languages

Transmission UNIX/XENIX INGRES/EQUEL ANSI/CCITT SS7 X.25 Matrix Analyst Work Station **Administrator Data Communication** DataBase Management Quality Assurance Systems/Internals

Development

DSC Communications Corporation is located in the Dallas suburb of Plano, TX. This sprawling community offers an excellent public school system and easy access to an abundance of cultural and recreation activities. To learn more about our challenging technical careers, contact: DSC Communications Corporation, Attn: NPG/CW514, MS110, 1000 Coit Road, Plano, Texas 75075.



#### **DSC Communications Corporation**

An Equal Opportunity Employer.

#### TO LEARN! TO SERVE!

Are these the things you want? Read onl

Since 1976 we have been a leading consulting firm in the development of mainframe applications using state-of-the-art technology.

Our CALIFORNIA REGION currently has the need for profession-als with a min. of three years ex-perience and one or more of the following skills: TOHOWING Skills:

DB2/CSP
DB2/SQL/QMF
M204
COBOL/YSAM/CICS
PAYROLL/IDMS/ADSO
TESSERACT
VAX/FORTRAN/3D Graphics
X WINDOWS/PHGS/Toolkits
CAM POST PROCESSOR/
NC PROGRAMMER
CAE (PATRAN)/CAD S/W
INTERFACE

- Benefits include tuition reimburse-ment and profit sharing, competi-tive compensation and a variety of project assignments. Send re-sume to:

**DATRONICS** 14241 Firestone Blvd. Suite 220 La Mirada, CA 90638

Call Collect: 213/802-3262



& TULLY C UNIX AS400 COBOL

Check us out, Multimillion Dollar International provider of Software and Services growing at over 100% annually. Co-paid Benefit Plan and unlimited Internal opportunities.

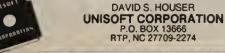
BRANNON & TULLY, INC. 6201 Fairview Rd, Ste 200 3169 Holcomb Br. Rd, Ste 675 Charlotte, NC 26210 Norcross, GA 30071

#### SUNBELT OPPORTUNITIES

**UNISOFT Corporation** has both contract and permanent openings for D.P. professionals with the following skills:

DEC VAX, VMS, C, RMS VAX SET (UTILITIES), DATABASE DESIGN, HP 9000, 3000, APOLLO, MOTIF, C, PRIME, PRIMOS INTERNALS, ORACLE, INGRES, Rdb - ALL PLATFORMS.

For a challenging, and financially rewarding career, please call, fax or send your resume to:



TEL: (919) 544-7111 FAX: (919) 544-2158



#### Join Our Aggressive **Applications Development & Operations Support** Teams.

CAROLINA POWER & LIGHT COMPANY, a major force in Southeastern power generation and distribution, offers information systems professionals the kind of environment that will provide long-term professional and personal satisfaction—the latest in proven technology and an appealing lifestyle. We're looking for data processing professionals to join our team and provide aggressive applications development and operations support

Along with wide use of personal computers, we're operating one IBM 3090-300, one IBM 3090-200, and one Amdahl 5890-300. The CICS on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE

We have recently completed a large strategic planning study and have a significant hacklog of technical and application development projects. We are currently seeking the following:

#### APPLICATIONS DEVELOPMENT **Programmers**

Positions require 4 + years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

#### Systems Analysts

Positions require 4 + years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/I knowledge. A four-year degree is preferred

#### **DATA ANALYST**

Position requires 4+ years experience in data administration, database administration, or systems development. At least 1-2 years experience in logical or conceptual data modeling is also required, as well as experience with CASE tools. Excellent interpersonal and communication skills are essential, and JAD facilitation skills are highly desirable. Some task or project management experience is also desirable. A four-year degree is preferred.

#### DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2 or DATACOM/DB. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

#### SR. DATA COMMUNICATIONS ANALYST

Position requires 5 + years experience in data communications in a large systems SNA environment. Knowledge of PC Local Area Networks desirable. Excellent written and verbal presentation skills, as well as project management and planning experience, are a must. A four-year degree is preferred.

The quality of life in the beautiful Carolinas is one on which to boast. We offer a mild but seasonal climate, a moderate cost-of-living, excellent schools and universities, and a myriad of cultural and recreational activities. With CP&L located in the capital city of Raleigh, the mountains and seashore are just a few hours away.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of our important team of professionals, send resume with salary requirements to: Randy Millwood, Senior Recruitment Representative, Dept. CW52190, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602. An Equal Opportunity/Affirmative Action Employer.



Carolina Power & Light Company **Energy in Operation** 



Florida's premier Information processing centers, have Immediate needs for professionals with ex-

perience in any of the following:

• COBOL, PLI, ALC, RPG3, "C", CICS

• FOCUS, ORACLE, INFORMIX

 DB2/SQL, IDMS, M204, IMS · TANDEM COBOL, TAL, PATHWAY

· DEC/VAX, UNIX, PICK PCS/ADS, MCCORMACK & DODGE

It's your move, make it the RIGHT ONE.

One Harbour Place

Digital NEWS, the newspaper for VAX Systems Management is a publication of International Data Group

#### APPLICATIONS PROGRAMMER

For program development using database management techniques and a fourth generation language for applica-tions in the publishing industry.

Requirements: B.S. in computer science or equivalent. Familianty with VAX/VMS, DCL procedures. Good verbal and communications skills. Experience with COGNOS' POWERHOUSE under VMS a must

Please send resume and salary requirements in confidence to:

MIS Department Digital News Publishing, Inc. 33 West St., Fifth Floor Boston, MA 02111



No telephone inquines please. Principals only.

#### **Build Your Future While You Build The Future Of Space**

At McDonnell Douglas Space Systems Company, our commitment to maximize the potential of our professionals stands as strong as our commitment to develop the world's most sophisticated space technology. Most important, you will excel in a supportive environment where creativity and career development are exceptional.

Our Space Station Division Computer Systems Support Group is rapidly expanding its database development and support capability. Qualified candidates should have a BS or MS in Computer Science or a related field. Excellent written and oral communication skills and experience with VAX, Macintosh or Oracle computing environments is desired. Positions are available for recent college graduates and professionals with experience ranging from two to fifteen years in one of the following areas:

- Applications Development
- Database Programming
- Database Administration
- Macintosh System Administration
- Senior Communications Engineering
- X Windows System Integration

Engineering Workstations System Management

For immediate consideration, send your resume and salary history to:

No matter where your career is heading, VISA can show you the way. As the world's

scale. We can connect you with one of the world's most sophisticated, large-scale computer systems. We can put you at the forefront of a technological revolution

that will soon change every transaction from high finance to fast food. Our growth has created several key opportunities at our San Mateo headquarters. If this is

Software QA Project Leaders and Quality Assurance Analysts Experience managing multiple and concurrent software test projects and

Strong software testing background in mini, micro, or mainframe platforms.

Experience performing logical data modeling, data analysis and administration

Requires strong data processing management experience, particularly in a large-scale IBM mainframe environment, managing operating systems.

Strong project management and business skills combined with bankcard

■ 2+ years of experience monitoring large-scale IBM mainframes in an

VISA offers an excellent compensation package including comprehensive bene-

fits. For immediate consideration, please send your resume to: VISA U.S.A., Dept. SW/5/14/CW, 3155 Clearview Way, San Mateo, CA 94402. For other VISA

opportunities, please call our JOB HOTLINE (415) 378-8299. We are an equal

We're everywhere you want to be.

where you would like to be, contact us about these positions.

MVS/TSO/ISPF, COBOL, and SQL, in a DB2 environment.

**Project Leaders and Programmer Analysts** 

■ IBM mainframe, COBOL, CICS, VSAM, and JCL.

■ TPF or strong assembler experience.

in a DB2 or related environment.

Manager, Systems Programming

experience and technical exposure.

MVS/XA, VTAM, SNA environment.

**SUNBELT & ATLANTA** 

\$25,000 to \$95,000

IDMS/ORACLE/DATACOM/IMS/DB2

VAX/MAPICS/FOCUS/SYS38/AS400

**TECHWRITERS/DP SALES/TANDEM** 

Need Programmers, Programmer/Analysts for Full-Time and Consulting Positions in IBM Shops. Relocation Expenses Paid. Send resume to:

Jim Heard, EDP Consultants, Inc.

3067 Bunker Hill Road, Suite 202

Marietta, Georgia 30062

24-HOUR FAX:

118

**Computer Operators and Network Technicians** 

Data Modeler

**Business Manager** 

opportunity employer.

largest financial payment system, we can steer you to responsibility on a global

#### MCDONNELL DOUGLAS SPACE SYSTEMS COMPANY

Professional Employment - Dept. CW-514 16055 Spacé Center Blvd. Houston, Texas 77062

Equal Opportunity Employer M/F U.S. Citizenship May Be Required

#### **Technical Support** Specialist Where Do You Want To Be?

ELT is looking to fill a position of Technical Support Specialist. This position involves the support of ELT's current and new customers, sales force, and technical staff. This position will require a tremendous amount of customer interface and extensive travel. The stall. This position win require a tremendous amount of customer interface and extensive travel. The position includes the installation of hardware and software training at the customer location. Extensive knowledge of PC/MSDOS is a requirement. A working knowledge of PC hardware and interfaces to host computer systems is a requirement. Laser printers used include Postscript, HPLJ, and Express printers and knowledge in these would be helpful. ELT's software is written in both Cobol and C, and the ability to program in one of these languages is required. A knowledge of both languages would be a plus. ELT's software runs under both DOS and UNIX operating systems and interfaces to a number of hardware systems.

If you would be interested in a position of this type please send a resume to:

**Electronic Label** Technology, Inc. 9916-A East 43rd St. Tulsa, OK 74146

SYSTEM ANALYST: Design, modify, and develop computer systems by coding discrete digital signals from image pictures so as to save space on channel capacity and improve image picture quality. Will use statistical analysis and engineering mathematic principles to segment pictures into programmable parts for use in restructuring picture to allow appropriate interface for use in acoustical microscopy machine to allow formation of exact image pictures and analysis copy machine to allow formation or exact image pictures and analysis of these pictures. Will perform in-terfacing between acoustical mi-croscopy machine users and cen-tral controlled computer. Requires M.A. or M.S. degree in Computer Science. Education to include one course in each of the following: En-gineering Mathematics, Operating Systems using C language, Com-puter Architecture, Software Engiputer Architecture, Söftware Engineering, Data Structure, Statistical Analysis. Hours: 8:30am-5:30pm. 40 hours per week at \$32,000.00 per year salary. Please send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State St. - 3 South, Chicago, IL 60605, Attn: CONNIE M. EVANS, Reference #V-IL-1328-E, AN EMPLOYER PAID AD.

Image Processing Software Engineer, 40 hrs/wk. 9:00am - 5:00pm, \$59.758/yr. Design and development of object-oriented application software in C and C++ under the ment of object-oriented application software in C and C++ under the UNIX operating system on the SUN workstation. Analysis/design of image processing subsystems to generate requirements, systems design documentation and test plans. Analyze image processing tools to implement in-house command line interpreter environment in C/UNIX. Develop algorithms to conduct calibration tests on RF circuitry. Apply Fourier analysis, DFT and FFT to reconstruct raw data in the generation of images. Master of Science in Computer Science as well as 1 year experience as an Image Processing Software Engineer or as a Software Engineer or as as Engineer or as a Software Engineer or as as well as 1 year experience as an Image Processing Software Engineer or as a Software Engineer or as a Software Engineer or as as well as the Engineer of Engineer or as a Software Engineer or as a Software Engineer or as a Software Engineer or as a Softwar

**MOVE SOUTH!!** 

AS/400 S/A MIg. \$37K AS/400 P/A RPG III \$35K SYS/38 to AS/400 P/A \$30K

SYS/3B RPG III Jr. P/A \$28K

All Expenses Paid By Client Company! 100's of S.E. Opportunities

**CALL/FAX: RANDY PAUL** 

REGENCY
Personnel Consultants
P.O. 80x 14905
Greensboro, NC 27415

Call [919] 373-1991 FAX [919] 373-1998

IBM 30XX Proj. Ldr. IBM MVS/XA S/A IBM COBOL CICS P/A

#### TANDEM

Contact: **Danny Tipton** 

2 vrs + Experience Consulting &
Permanent Positions
Openings Nationally

Triple I, Inc. P.O. Box 411838 Kansas City, MO 64141

1-800-444-8101 in Missouri (816) 444-8100 Fax (816) 444-8816

Contact:

**Boon Siang Lee** 

#### The Right Person. Right Now.

At ROMAC, we don't just fill job openings. We build careers.

If you have experience in data processing, we can build a career for you. We'll help you make your resume outstanding and stand out in the crowd. We'll work with you to find the opportunity you like. We're your partner in the career building process.

Our track record speaks for itself. We're professional ourselves, with across-the-board experience in data processing. We know the job market, and appreciate your value to employers.

Interested in learning more? Give us a call. In strictest confidence, of course.

#### 35: ROMAC

Prime franchise locations available. For information, call Rick Sandler at (800) 341-0263.

ASSEMBLER SOFTWARE ENGINEER required. Design and analysis of applications software in the PSS (Passenger Services System) Product Creation area. Initiates rec-

PSS (Passengler Services System) Product Creation area. Initiates recommendations for new/improved systems for implementation to management. Conducts feasibility studies on new products and systems evaluated for installation. Will work in the management and systems design area using knowledge of PC and network architecture, "C" programming language and Basic Assembler language. Work to be performed in a real-time environment. Applicant must possess a bachelors degree in computers, math or engineering plus two years experience in Assembler coding and "C" programming and analysis. Education and experience will be found acceptable if applicant has a combination of experience and education equivalent to a bachelors degree in computers in addi-

and education equivalent to a bachelors degree in computers in addition to the two years experience with Assembler coding and "C" programming and analysis. Annual salary will be \$35,000/year for a 40 hr. week. Additional salary up to \$39,000/year may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Dallas, TX, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O.# 5518183. This ad was paid by an equal opportunity employer.

#### CA & AZ **CONTRACTS**



P. Murphy & Associates, Inc.

1405 RIVERSIDE DRIVE, SUITE 100 BURBANK, CA 91505 (818) 841-2002 (714) 552-0506 FAX: (818) 841-2122

#### COLORFUL **COLORADO**

**Senior Programmer** and System Analyst

Programmer - \$30,348-\$35,124 Requires bachelor's in related field and three years of program-ming in COBOL, two of which must have been with IDMS data-

Analyst - \$35,124-\$40,656 Requires bachelor's in related field and three years of analyst experience including two years of general business systems analysis work and one year of IDMS.

Send resume and letter addressing qualifications to: University of Northern Colorado, Personnel, Carter Hall, Room 2002, Greeley, CO 80639. Colorado residents will be given preference. AA/EOE.

#### MIS

OCS, a leading systems software developer, has openings in our R&D dep1. for:

Project Leader/Designer

SAN FRANCISCO HP3000, UNIX, VAX

 Sr. Systems Programmers Requires 5+ years of strong systems programming & product development expenence in MPE/PASCAL, UNIX/C or VMS/C.

We offer great compensation, benefits, profit sharing & stock, plus e high-pace low-bureaucracy environment conducive to visibility & personal accomplishment.

OCS, 560 San Antonio Road, Palo Alto, CA 94306,

415-493-4122 Immediate Permanent/Consulting

TANDEM OPPORTUNITIES

East Coast/Mid-West/West Coast

Junior & Senior Level P/A's Project Management PATHWAY, SCOBOL, COBOL, Non-Stop SQL, TAL, C, SNAX

Banking, Brokerage, Telephony Manufacturing, Comm & others Mail or Fax resume to Steve at:

Professionals, Inc. 11827 Breton Ct., Ste. C12 Reston, VA 22091-3224

Serving Only TANDEM Users & Professionals Across the U.S.

THE HYLTON COMPANY National recruiting firm has an immediate need to fill the following

MANAGER MIS

Must have System/38 management experience in food distribution industry Mississippi location, Low 50's. HP 3000 COBOL

HP COBOL Programmer needed with 3-5 years manufacturing experience. Atlanta, Mid 30's.

**DEC/VAX COBOL** Senior Consultant for major soft ware vendor. California, 50K.

Sr. Prog/Analyst. Must have VAX/VMS COBOL. RDB a plus. Locations in Georgia and California. 24-40K.

THE HYLTON CO. 1872 Independence Sq. Suite A Atlanta, GA 30338

#### ADABAS/NATURAL

ADABAS/NATURAL Programmer/Analysts needed for both PERMANENT and CONTRACTUAL positions nationwide. 3+ years exp. required These positions won't last long!

ADEPT, Inc. 36 Washington Street Suite 310 Wellesley Hilis, MA 02181 (617) 239-1700

#### **DPJOBS**

Check job listings on avail perm positions & contract openings. Register on our B B S; Mon-Thu, 5:30 pm -9 am, wkends & holidays 24 hrs, at 404-984-8117 Micros to Mainframe - all positions. For info call CREATIVE DATA SO-LUTIONS, 404-984-8116, 2470 Windy Hill Rd., Ste 461, Manietta, GA 30087. Codes: BR-1200/ 2400, 8-N-1,R.

#### **DATA BASE** CAREERS

IDMS DBA Mgr. Dallas \$62K IDMS DBA Houston \$45K IDMS DBA, CICS Dallas \$152K IDMS DBA San Antonio \$45K IDMS DBA San Antonio \$45K IDMS DBA San Antonio IDMS DBA Sunnyvale \$60K IDMS DBA CICS Dallas \$55K DB2 Systems Dal/KC/F1W \$50K DB2 Systems Dal/KC/F1W \$50K IDMS P/A, ADS-O Dallas \$35K IDMS P/A, ADS-O Dallas \$38K IEF Encycl Admin Dallas \$50K IDMS P/A, ADS-O Dallas \$35K IDMS P/A, ADS-O Dallas \$38K IEF Encycl Admin Dallas \$100K IDMS P/A, ADS-O Dallas \$30K IDMS P/A, ADS-O DALLAS P/A, ADS-O D

Harold M. Herrison InfoTech Seerch Consultant 8700 King George Drive, S.102 Dallas, Texas 75235 (214) 638-0058

### DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 612,000 computer professionals every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Com-puterworld's Computer Careers section for your

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Computerworld Weekly, Regional,

National. And it Works.

MAY 14, 1990

PHONE: 404-971-7281 Box 3834, Little Rock, AR 72203 (501) 327-5216 DEC 404-973-4052 COMPUTERWORLD

Current Needa:

• IMS DB/DC

CONSULTANTS

Nationwide

IMS DB/DC
 CICS
 VAX/RDB/COBOL
 DB2
 NATURAL/ADABASE PPG III
 IDMS/ADSO DATACOM
 UNISYS/LINC/LINC II

Future Needa:

• IMS DB/DC

• HONEYWELL

• VAX/ORACLE/VMS

• UNIX

• UNISYS/LINC/LINC II

• ADF

Please call or send resume to

CORPORATION

Technetics

# MARKETPLACE

# Outsourcing: Avoiding pitfalls

Be sure your contract addresses key areas like growth and new technology

BY RAYMOND T. NIMMER SPECIAL TO CW

ighter budgets, better technology and widespread publicity have stoked interest in outsourcing to an all-time high. Although companies for years have had the choice of handling their data processing internally or farming it out, today, the issue is on the minds of more managers than ever.

Although outsourcing has been around for a while, purchasing the services can be a tricky business. Some of the rules just call for common sense. But outsourcing is in some ways a unique undertaking, so successful buyers need to pay close attention to the issues it entails.

The most basic question that organizations need to ask is: "Should I outsource at all?" Unfortunately, many firms decide to outsource when they need a comprehensive upgrade of their hardware. As a result, they view outsourcing simply as a capital investment issue. The question becomes: "Should I spend the resources — perhaps several million dollars — to create and maintain an in-house system, or should I shift that cost to the outside party?"

There is no general answer to this question. Arriving at the correct solution requires an examination of a company's unique characteristics, including its human resources and technological infrastructure. Even if an organization eventually decides against

outsourcing, simply undertaking this kind of probing investigation can be beneficial because it generate insights regarding these critical aspects of the business.

Companies that do opt to outsource must face a number of critical decisions about how to protect themselves in the joint venture. That's right — joint venture. In an outsourcing relationship, the customer enters into a long-term partnership with the service provider. As in many joint ventures, poor performance on the part of the provider might cause the client company to fail.

For big organizations, the typical outsourcing contract covers a lengthy period of time usually 10 years. While this arrangement lets the service provider amortize the cost of its computer systems, it also means that the client is bound to a partner for what seems like eternity in the fast-changing information systems business.

Besides the length of the relationships, the raw material involved, information, also makes outsourcing contracts unusual. These two components mean

> that contracts must thoroughly address some key areas. They include the following:

> • Growth. The relationship needs to provide for the possibility that the client's needs will grow

substantially. For example, if an organization adds a new division, the client should know if the service provider can or will expand its facilities to meet the new needs. Managers need to look closely at a prospective service provider and satisfy themselves that it can meet their future requirements.

• Revisions. Companies entering outsourcing relationships need to establish what rights they have to bring some or all of the processing back in-house without terminating the contract or paying a stiff penalty.

• Security. The outsourcing relationship must make explicit provisions for maintaining the

confidentiality and integrity of the data. The firm must ensure that the service provider won't share critical data or let other parties gain access to it. Organizations need to ask what standards of security the contract imposes on the service provider.

must also include provisions that state the service provider will use up-to-date systems. Firms must ask what rights they have to influence the development of the service provider's system.

Stipulations in this area should deal not only with devel-

LTHOUGH OUTSOURCING has been around for a while, purchasing the services can be a tricky business.

• Reliability. Firms must make sure they are dealing with a stable partner and that they maintain continued access to their information if the service provider encounters financial problems during the course of their relationship. Thus, the outsourcing contract must stipulate how the client can access, retrieve or transfer its data if the provider closes or goes into bankruptcy.

• Accountability. Contracts should spell out which party is responsible for errors or information that is lost in the course of processing. Under what circumstances is each party responsible? How broad is the party's responsibility? What measures must the service provider take to ensure the security and integrity of data? What amount of insurance must the provider maintain against the risk of information losses?

• Technology. Given their length, outsourcing contracts opments in technology but also with the process of choosing which system the service provider will operate five or six years down the road.

Nimmer is Foundation Professor of Law at the University of Houston, counsel to the law firm Sheinfeld, Maley & Kay and author of The Law of Computer Technology (Warren, Gorham & Lamont, New York).

#### Index

Marketplace119
Time/Services
Data Conversion121
Buy/Sell/Lease121
Graphics/Desktop Pub 123
Bids Proposals/Real Estate 123
Peripherals/Supplies 123
Software
Business Opportunities123
Training124

#### Time/Services

#### REMOTE COMPUTING

- We locate COMPUTER TIMESHARING.
- ALL mainframes. We find your LOWEST
- NEVER a charge to
- the Seiler.
- Nationwide service since 1968.

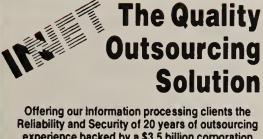
CALL DON SEIDEN AT COMPUTER RESERVES, INC. (201) 688-6100

Go Shopping in... Computerworld's

CLASSIFIED MARKETPLACE

> Call for all the details

(800) 343-6474 (In MA., (508) 879-0700)



experience backed by a \$3.5 billion corporation

#### 1-800-222-1590

- Save 20% to over 50% with high service level guarantees
- Four IBM 3090's with MVS/ESA and VM/XA
- Wide variety of software products including all major databases

Unlike Facilities Management, you maintain control while reducing your costs and improving your service.

Information Network Corp., Dallas, TX



#### Outsourcing... When Time, Capital **And Quality Count**

**Litton Computer Services** frees you from the day-to-day grind of data center management . . . so you can concentrate on your business.

Cost-effective, fixed-price solution to in-house computing with the resources and expertise necessary to fit your

- Multiple Data Centers
- Large-Scale Information Systems
- Nationwide Network
- Remote Facilities Management
- Migration Specialist
- Operating System ConversionsIntegrated Financial Systems

Major third Party Software Packages

Contain your costs without losing

CALL 1 800 PLAN LCS. (1 800 752-6527)

#### Litton

Computer Services

#### **SUNGARD**

#### **COMPUTER SERVICES**

. OUTSOURCING EXPERTISE

. FIXED PRICE COMPUTING

**ECONOMICAL PRICES - SIGNIFICANTLY** LESS THAN IN-HOUSE

.IBM 3090 COMPUTERS WITH MVS/ESA, AND VM TECHNOLOGY

EXTENSIVE NATIONWIDE NETWORK

. EXTENSIVE LIBRARY OF THIRD PARTY SOFTWARE

. PROFESSIONAL SERVICES FOR APPLICATION SUPPORT & DEVELOPMENT

#### FOR MORE INFORMATION CALL:

(800) 441-4203

(215) 387-3890

(212) 943-9540

SUNGARD COMPUTER SERVICES INC. 1285 DRUMMERS LANE

**WAYNE, PA 19086** 

#### **COST-EFFECTIVE COMPUTING SERVICES** for TODAY and.... **TOMORROW**

**COMDISCO COMPUTING** SERVICES CORP.

Provides you with:

REMOTE COMPUTING **COMPUTER OUTSOURCING FACILITY MANAGEMENT** 

- IBM® CPUs and Peripherals
- **Systems Software:** MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: **Database Management Application Development** 4/GLs Graphics Statistical Analysis
- **Multiple Communications** Methods
- **Technical Support**
- Automated Tape Handling
- **ULTRA-Secure Data Center**
- Advanced Laser Printing
- Pricing to fit your needs

Call: Robert Marino 201-896-3011 

COMDISCO COMPUTING SERVICES CORP. 430 Gotham Parkway, Carlstadt, NJ 07072

- TRAINING, INSTALLATION, SALES AND SUPPORT
  - Wordperfect 5.0 for VAX/VMS
  - Wordperfect "Office" for VAX/VMS Wordperfect PlanPerfect for VAX/VMS

  - Wordperfect All-In-One Integration
  - Wordperfect upgrade 4.2 to 5.0
  - VMS System Management VMS Installation
- **EXPERTS IN:**
- Office Automation/Feasibility Studies
  - Document Management Systems - VAX/VMS, Novel
  - Networking, VAX PC Connectivity
- INSTALLATION
- SOFTWARE DEVELOPMENT
- DATA CONVERSION
- HARDWARE MAINTENANCE
- DATA WIRING (Unshielded Twisted Pair, Thin Wire, ETC.)
- TIMESHARING
- SITE SUPPORT/OUTSOURCING
- EXECUTIVE PLACEMENT

Omnicomputer, Inc 1440 Broadway New York, NY 10018

Tel. (212) 944-9230 Fax. (212) 869-2846

#### **Quality Outsourcing**

We Match Any Reasonable Offer

- ◆ IBM Mainframe/Peripherals
- ◆ Full Technical Support
- ◆ 24 hour Help Desk w/ 800#
- Database Conversions
- Automated Print Distribution ◆ S/38 Disaster Recovery
- ◆ Consulting Services
- ◆ Network Specialists
- Capacity Planning
- Automated Operations
- Laser Printing

MVS/XA, VM/XA, CMS, CICS, DB2/QMF, TSO/E, ISPF/PDF, SAS, Librarian, IBM IN, PANVALET, EASYTREIVE, Telenet/Tymnet, TOP SECRET

Call: Robert Weathers (201) 216-3216

RECRUIT U.S.A., INC.

#### Let Us Be Your Data Center

Get high-quality computing service that can make a difference to your bottom line. From MCN Computer Services.

State of the art IBM Compatibility:

#### **MVS-ESA**

VM/XATSO E ROSCOE CICS IMS IDMS/R DB2 QMF **PROFS** 

NATIONAL COMPUTER SERVICES, INC. 176 W. Adams St., Suite 1700 ° Chicago, Illinois 60603 Telephone 312-781-9000 ° Toll-free 800-992-7171 FAX: 312-372-5157

**OUTSOURCING** 

IBM/AMDAHL USERS

**QUOTES BY PHONE** 

OUR SERVICES AND PRICES ARE BETTER THAN ANYONE ADVERTISING IN THIS SECTION

COMMITTED TO CONTINUAL DEVELOPMENT & IMPROVEMENT OF OUR SERVICES AND PRODUCTS ..... TO BENEFIT YOU

FOR MORE INFORMATION CALL JIM NEAGLE 312-781-9000 800-992-7171

Computerworld's

Classified

Marketplace

showcases

your ad by

product

category!

Whether it's used

equipment, software,

time, services or just

about any other cate-

gory of computer

product or service,

Computerworld's

Classified Marketplace

is organized to make

your ad visible and to

make buying your

Just look!

Computerworld's

Classified Marketplace

**Product Categories** 

buy/sell/lease

hardware

software

communications

graphics/desktop

publishing

time/services

bids/proposals/

real estate

business opportunities

So if you're selling

computer products or

services, advertise in

the newspaper that

product or service.

Advertise in Comput-

erworld's Classified

For more

information, call

YOUR

showcases

Marketplace!

product easy.

LASER PRINTING & IMAGE/FORMS DESIGN APPLICATION BACK-UP

REMOTE FACILITIES MANAGEMENT
CONSULTING SERVICES
PROGRAM DEVELOPMENT
MICRO/MAINFRAME APPLICATION
WORLDWIDE ACCESS

MVS/XA SNA/SDLC CICS TSO SAS DB2 OMF

Programmer Productivity Aids:

FILE-AID CICS PLAYBACK dBUG-AID

ABEND-AID CICS ABEND-AID

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- · Operations 7 days a week 24 hours a day
- Network Management

For more information, call Lisa Walker at: 1-800-521-0444

#### **MCN**

Computer Services, Inc.

5225 Auto Club Drive Dearborn, MI 48126

#### REMOTE COMPUTING OUTSOURCING

- MVS/XACICS
- TSÓ

- IMS/DBDC
- **OVER 150 SOFTWARE PRODUCTS**

#### DEVELOPMENT DEBUGGING

- PRODUCTIVITY
- PERFORMANCE
- TYMNET

- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE MIGRATION MANAGEMENT

SYSTEMS, INC rca Drive, Oak Brook II 60521

708-574-3636

New England 617-595-8000

• DOS/VSE • CMS



TSO/ISPF/SDSF **CICS ADABAS** LIBRARIAN

VTAM **FILE-AID** INTERTEST

SIMWARE ACF2 ADC2

- 24 hour availability International access
- Superior technical
- Uninterrupted Power Supply - Certified on-site vault
  - Disaster recovery support staff - Impeccable service

Call Now - Solve Your Computing Worries

**TODAY & TOMORROW!** 

800/343-6474 (201) 685-3400

(in MA, 508/879-0700).

MAY 14, 1990

Resources Available Include:

EXCLUSIVE OFFERING FREE TRIAL PERIOD -**MAJOR COST SAVINGS** 

**FULL SERVICE** COMPUTER PROCESSING

IBM 3090 Processor MVS/XA & VM/HPO, TSO, CICS

- Broad Software Support Product Line
- Domestic & International Network
- PROFS, Decision Support Products
- Data Base Management Banking/Financial Services

**Call Mike Shields** 

**Senior Account Representative** 1-800-443-8797

Guaranteed Lowest Rates in the Industry Allowances for Peak/Cyclical Processing



CHANTILLY, VIRGINIA





# **DUPLICATION**

"THE ONE STOP SHOP FOR **SOFTWARE DEVELOPERS"** 

> **STOP** going to 5 different suppliers! It can all be done with one easy phone call.

Our Services Include:

- ► Special Silk Screening Process for 3 1/2" and 5 1/4" Diskettes. We can print right on the shutter of each 3 1/2" disk or right on the jacket of 5 1/4" disks!!
- ► Printed Diskette Sleeves
- Printed Diskette Labels Printed Binders & Slipcases
- ➡ Printed Documentation Pages
- Duplication Equipment ► Low Cost Diskettes

"You have to make but one phone call to the Corporate Disk Company and can consider the job done.'

In Illinois (708) 439-DISK Nationwide 1 (800) 634-DISK C 1969 by CD Marketing Inc.

COMPUTERWORLD

SYSTEM

36|38

POINT

OF

SALE

ASSOCIATES

(800) 888-2000

9370 4381

Processors

Peripherals

Upgrades

#### Time/Services

#### **OUTSOURCING AND** REMOTE COMPUTING

- IBM MVS/XA
- Environment DB2, IDMS/R, Model
- 204 and 4GLs Professional Support
- Experienced Migration Manage ment Team
- Simplified Pricing and Invoicing
- AS/400
  - Full Supporting Services
  - Media Conversion Laser & Impact Print Facility Application
  - Programming
  - Technical Support
  - 24 Hours a Day 7 Days a Week

### May & Speh, inc.

1(800) 729-1501

#### **ON-LINE WITH** COMPUSOURCE

- Multiple centers
- ▲RACF, CICS, IMS
- ▲ Volume & term discounts
- Full technical support
- ▲ Disaster recovery services

**ECOMPUSOURCE** (919) 469-3325

It's the

#### Classified Marketplace

Reach Computer Professionals Where They Shop For:

- □ Buy/Sell/Lease
  □ Hardware
  □ Software
  □ Peripherals/Supplies
- ☐ Communications
  ☐ Graphics/Desktop
- Publishing

  Time/Services

  Bids/Proposals/Real
- Estate

  Business Opportunity

**CALL NOW** 

800-343-6474 (in MA., 508/879-0700)

## RAISED **FLOORING**

MVS/XA, VM, DOS

Laser printing

SAS, DB2

*Immediate* **Delivery** 

Quality Installation

Raised

(201) 666-8200 FAX (201) 666-3743

# **NEW & USED**

**Computer Floors** One Charles Street Westwood, NJ 07675

### **Data Conversion**

#### When it's time to get SERIOUS about document and data **CONVERSION**

MMC has the skill and experience to help you get from old system to new quickly and cleanly. This industry pioneer provides both service bureau and in-house conversion solutions. The firm's R&D has produced many unique and unusual capabilities. Large and technically challenging projects are a specialty.

"We do the tough ones!" Muller Media Conversions, Inc. 32 Broadway, New York, NY 10004 ) 344-0474 fax: (212) 968-0789 (212) 344-0474

#### Your used computer equipment deserves a second chance.

If you have used computer equipment to sell, Computerworld's Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Buy/Sell/ Lease section to help you market your equipment to the very people who are looking to buy.

And when you advertise in Computerworld Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to Computerworld for news, information, features -and the Classified Marketplace -every week.

So give your used computer equipment a second chance today.

To reserve your space, call:

800/343-6474 (in MA, 508/879-0700)

## HONEYWELL LEVEL 6 DPS 6 SERIES 16

- Complete Minicomputer Line -- New & Used
- All Peripherals &
- Upgrades and Features
- Depot Repair Capability Honeywell Maintenance
   Guaranteed
  - Immediate Delivery Low Prices
- HDS 5 and HDS 7
   Compatible Terminals

The Recognized Leader Sales and Support



BOUDREAU **COMPUTER SERVICES** 

100 Bearfoot Road Northboro, MA 01532 (508) 393-6839 FAX 508-393-3781 "Since 1974"



- Data General
- Fujitsu
- Data Products
- CDC
- Printronix
- Zetaco

**BUY SELL** TRADE

617/982-9664

FAX: 617/871-4456

#### Reconditioned digitalIRM

Equipment

Whatever your requirements are for Digital & IBM Equipment, call CSI first! Buying, seling, trading, leasing, consignments - we do it all!

CSI sells all equipment ith a 30 day unconditional guarantee on parts and labor and is eligible for DEC or IBM maintenance.

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many

Compurex Systeme, Inc. 83 Eastman St, Eeston, MA 02334 Cell Toll-Free 1-800-426-5499 In Mass. (506) 230-3700 FAX (508) 238-8250

#### 370's Γhat's All We Do!

From 20's to 90's Most Machines, Peripherals & Features IN STOCK

Call us for a quote 708-831-1255

Executive Infosource 1530 Eastwood Ave., # 100 Highland Park, IL 60035 COMPANY DOORS

#### CLASSIFIED MARKETPLACE

Where Computer Professionals Shop

(800) 343-6474 (in MA, 508/879-0700)

# AS/400

SERIES

18377 Beach Blvd., Suite 323

Huntington Beach, CA 92648 (714) 847-8486

IBM

Member
Computer Dealers
& Lessors Association

**LDLR** 

**Specialist** Buy • Sell • Lease

Large Discounts

Full IR Support S/36 • Upgrades

Tradeins

800/451-3407 CA: 213-372-8098 Fax: 213-372-7493

Strand Computer Resale 1800 The Strand Hermosa Beach, CA 90254

## IBM 3191 & 3192 DISPLAY STATIONS

AS1400

**BUY · SELL · LEASE** 

FOR SALE OR LEASE

WITH WARRANTY REMAINING - REFURBED AND PACKED

DEMPSEV

CONTACT MARSHALL CROMWELL (703) 264-2419 FAX (703) 476-5767



**PACIFICORP** Capital, Inc.

## WILL DEC COMPATIBLE

#### • SYSTEMS • PERIPHERALS • NOVELL AUTHORIZED

CPUS • MEMORIES • DISC & TAPE DRIVES • CRTS
• TERMINALS • PRINTERS • INTERFACES Etc.

DIGITAL COMPUTER EXCHANGE INC 2487 Industrial Pkwy. West, Hayward, CA 94545

Digital Dealers Associates Fax (415) 887-3100 Page 15 Call (415) 887-3100 \* Registered trademark of Digital Equipment Corporation

WE BUY and SELL NEW-USED - ASIS APOLLO, DEC, HP, SUN, WANG CDC, MAXTOR, MICROPOLIS Fex us your excess listings Call us for current inventory on above Industrial Electrosurplus Tel (508) 768-3480 FAX (508) 768-3479

#### 8820 FOR SALE

We have been retained to sell a VAX 8820 Model 886CA-AP that has been on continuous DEC maintenance and will be DEC deinstalled on 6/1/90. Complete with 128KB memory and

MEADOWLARK ENTERPRISES 508-777-4666



#### IBM SPECIALISTS

SELL • LEASE • BUY S/34 S/36 S/38 AS/400 3741

\* New and Used

\* Upgrades and Features

- \* IBM Maintenance Guaranteed
- \* All Peripherals
- \* Immediate Delivery \* Completely Refurbished

800-251-2670 IN TENNESSEE (615) 847-4031

CMÁ COMPUTER MARKETING of America, Inc.

PO BOX 71 ● 610 BRYAN ST. ● OLD HICKORY, TN 37138

## INTERNATIONAL COMPUTER EXCHANGE LTD

BUY • SELL • LEASE • NEW • USED PERIPHERALS • SYSTEMS • UPGRADES

#### RECONDITIONED COMPUTER EQUIPMENT 1-800-ICE-BUYS

digitall ♣ Data General

SUN

apollo

PC/AT/PS2

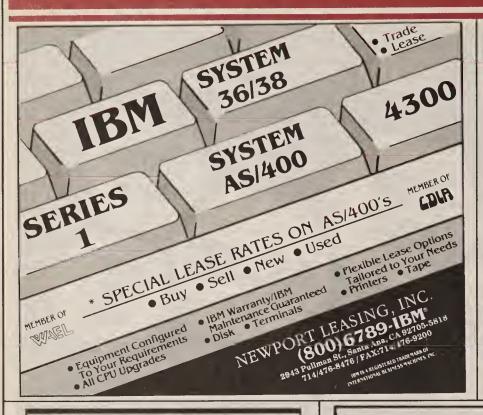
Whatever your Equipment needs are Call us today whether you are buying, selling, trading, leasing or consignments with 14 years in the trade - ICE, Ltd. does it all. All our equipment comes with a 30 day unconditional guarantee

WANTED EXCESS AND OBSOLETE COMPUTER EQUIPMENT

\$ TOP CASH PAID \$ - Call today for quote -1-800-ICE-BUYS

INTERNATIONAL COMPUTER EXCHANGE, LTD. TEL.: (617) 585-8688 • FAX: (617) 585-9177 • 163 MAIN ST. • KINGSTON, MA 02384 •

MAY 14, 1990



R7 RS/6000 SERIES/1 3X,AS/400 937X 4300

Currently replacing Series/1's with the new RS/6000 line via EDX to AIX migration

612-942-9830

DATATREND:

10250 Valley View Road Suite 149 Eden Prairie, Minnesota 55344

## **Convex Supercomputers**

-- Sale or Lease --

System 1: C1/XP Ser. #00171

- -- 48MB ECC memory
- -- (2) 434MB disk w/controllers
- -- tape subsystem
- -- Call for Complete Configuration

System 2: C210/XP Ser. #00115

- -- 512MB memory
- -- tape controller
- -- disk controller
- -- Call for Complete Configuration

**Systems Priced To Move Today** 

Call Kim DiTomassi 708-317-2177 or 800-426-3090



570 Lake Cook Road Deerfield, Illinois 60015-9850

## **CALL US LAST**

**GET YOUR BEST PRICE** THEN CALL COMPUTER BROKERS, INC.

WE

Buy - Sell - Lease New and Used IBM Equipment AS400 - System 36, 38, 43XX

# CB CB CB CB CB CB CB CB CB SHORT TERM RENTALS

Call 800-238-6405 IN TN 901-372-2622

СВ



CB CB CB CB CB CB CB

CB CB

CB

**COMPUTER BROKERS, INC.** 2978 Shelby St., Memphis, TN 38134

'Since 1974'

CB CB CB CB CB CB CB CB CBCB CB CB CB CB CB CB CB CB CBCB

> \*\* For Sale \*\* Sperry 2200/201

12 BM Memory

8 170 MB Internal Disk Drives

8 516 MB External Disk Drives

4 1600/6250 Tape Drives 2 1200 lpm Printers

1 DCP/20 1.5 MB Memory & 14 Lines 9 UTS20 Terminals

Available 7/15/90 Call 214-650-3219

#### NEW WANG PC\*s at Significant Savings

- Custom configurations for LANetworking
- Professional Service, Fast Delivery

■ Also IBM, Epson, NBI, HP, NEC and Arche PCs.

#### ALSO WANG REMANUFACTURED **PRINTERS · VS · PERIPHERALS**

SAVE UP TO 50%

■ Remanufactured equipment qualifies for free WANG installation and is guaranteed for the WANG Service Contract

■ Large Inventory, Fast Delivery



1-800-223-9264 AUTHORIZED WANG PC \*

AND REMANUFACTURED DEALER
\*EASTERN ZONE AND SOUTHERN CALIFORNIA ONLY

#### HP ΗP HP HP

1000 30009000 Including Spectrum

Processors ● Peripherals ● Systems

All in Stock - Immediate Delivery All warranted to qualify for manufacturer's maintenance

BUY ● SELL ● TRADE ● RENT ● LEASE

**ConAm Corporation** 

It's Performance That Counts!

800/643-4954 213/829-2277

## ASSCOM **WORKSTATIONS**

(1) 54P-01 w/ RTU, C Lang, MEX-534-4 (2) B55P-02 complete configurations

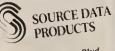
Sale or Lease • Immediate Delivery • Eligible for Maintenance

Call Now • 617-267-8600 **EQUIPMENT REMARKETING CO.** 



■ SYSTEMS

■ PERIPHERALS ■ UPGRADES



19762 MacArtbur Blvd. •120, Irvine, CA 92715

(714) 851-1970 (800) 333-2669



#### **IBM**

BUY SELL **LEASE** 

PS/2 OPERATING **LEASES** 

3084 3090 **PERIPHERALS** 

> OEM/PCM **LEASES**

800-888-7568 FAX 214/783-1379

1978

#### **VAX RENTALS**

MV 3600 MV 3800/3900 VAX 6000 SERIES **VAX 8000 SERIES** Systems & Peripherals

• Fast Turnaround • Dependable Products Upgrade/Add-On Flexibility

● 6 Months ● 12 Months ● 24 Months

BROOKVALE ASSOCIATES

CDUR Computer Dealers

WE

SELL

 $\mathbf{B}\mathbf{M}$ 

AMCOM.

CALL TOLL FREE

800

328-7723

612-829-7445 5555 WEST 78TH STREET

MINNEAPOLIS, MN 55439

FOR SALE

Honeywell

**DPS7/65** 

4 MEG MEMORY

MIU'S, Terminals

• 3-MS0556 4-MS0452

Contact:

**D.P. MANAGER** 

708-355-0958

Datanet 8

IBM

OOO Depth Depth Associat

EAST COAST (516) 273-7777

WEST COAST (206) 392-9878

### PRIME

**EXPERIENCED** SYSTEMS AND PERIPHERALS

> BUY-SELL-LEASE **BROKERAGE**

**NEW PLUG-COMPATIBLE** DISK, TAPE, MEMORY

THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC. 11460 N CAVE CREEK RD PHOENIX, AZ 85020 ASK FOR DON SHIFRIS

602-997-0997 Fax: 602-997-1688

Member Computer Dealers & Lessors Association

#### Want to Buy

3287 **Printers** or Parts

In as is or good working condition

#### Call:

Computer Service Supply Corp.

603-437-0634 Fax: 603-622-0128

Buy IBM Sell Unit Record Equipment, Data Modules, Disk Packs



Thomas Computer Corp. Toll-free 1-800-621-3906 In Illinois 1-708-647-0880

## For Sale

**NAS 9040** With 16 channels and 32 mega memory

**NAS 9070** 

With 17 channels and 32 mega memory

Call (313) 939-7000

#### Prime

**Experienced Systems** New & Used Peripherals Worldwide Service

Buy - Sell - Lease

OTW, Inc 305 Union St Franklin MA 02038 508-520-0250

#### The BoCoEx index on used computers Closing prices report for the week ending May 4, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	\$400	\$660	\$250
XT Model 086	\$500	\$700	\$350
XT Model 089	\$600	\$700	\$500
AT Model 099	\$1,150	\$1,375	\$745
AT Model 239	\$1,200	\$1,700	\$1,200
AT Model 339	\$1,370	\$1,400	\$1,000
PS/2 Model 50	\$2,060	\$2,200	\$2,000
PS/2 Model 60	\$2,060	\$2,200	\$2,000
Compaq Portable II	\$1,475	\$1,725	\$1,400
Portable III	\$2,300	\$2,500	\$1,900
Portable 286	\$1,700	\$2,000	\$1,700
Plus	\$750	\$950	\$675
Deskpro	\$825	\$900	\$800
Deskpro 286	\$1,400	\$1,625	\$1,300
Deskpro 386/16	\$2,500	\$2,750	\$2,475
Apple Macintosh 512	\$450	\$550	\$450
512E	\$450	\$450	\$350
Plus	\$1,050	\$1,200	\$1,000
II	\$3,300	\$3,500	\$3,050

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

CDLA

It's handsome. Tough. And

Transportation Association. High density foam lining

· Your personal label custom stenciled

FAX: 1-603-622-0128

approved by the Airline

Recessed hardware

In the US: 1 800 255-7815

JETSTREAM

The Ultimate 9-Track Tape System

A 9-track system that's fast and easy to use

THE FEATURES YOU NEED

 Fastest system available 25 MB/minute data conversion

and SunOS

and Sun 386i

on-board memory

Easy to use menu-driven software

Runs on MS-DOS, Unix, Xenix,

■ True 16-bit controller with 512 KB

Runs on PC, XT, AT, AT/386,

Prices start at \$149.00. Special needs are quoted immediately.

Call our Help-Line or FAX.

P.O. Box 673 • HillTop Center Bldg. C • Londonderry, N.H. 03053

#### **Graphics/Desktop Publishing**

**COMPUTERWORLDS's** 

CLASSIFIED MARKETPLACE

Examines the issues while Computer Professionals examine your message.

Call for all the details.

(800) 343-6474 (In MA., 508/879-0700)

## PC SCREEN TO BIG SCREEN

Look to BOXLIGHT for the Largest Selection of LCD Pads

TRUE COLOR SYSTEMS from \$4995 MONOCHROME SYSTEMS from \$599

Solutions for VGA, EGA, CGA All Macs, DEC VT 100s, 220s **IBM Terminals and More** 

**BOXLIGHT** CORPORATION

206/697-4008 VISA, M/C, AMEX, COD

Computer-Based Presentation Systems Since 1984

#### Bids/Proposals/Real Estate

#### Computerworld's

#### Classified Marketplace

gives you buyers with extensive purchase influence.

That's because Computerworld's Classified Marketplace reaches MIS/DP professionals who have extensive involvement in volume purchasing. In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

For more information, call

800/343-6474 (in MA, 508/879-0700).

#### MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equip-

Request for Proposal No. 1796, due Thursday, May 24, 1990 at 3:30 p.m. for the acquisition of a MS-DOS based local area network, related peripherals and software for the STATE OIL AND GAS BOARD.

Request for Proposal No. 1797, due Finday, June 1, 1990 at 3:30 p.m. for the acquisition of a turn-key multi-user Pharmacy System for the MISSISSIPPI STATE DE-PARTMENT OF HEALTH.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604

## 9-Track Tape For Your

**IBM** PC/XT/AT/PS-2™



Read 1600 or 6250 bpi 9-track tapes from a micro, mini or mainframe in EBCDIC or ASCII as mirror image or by individual files.

Use the 2000 PC" for disk backup, data interchange or archival storage. PC/XT/AT/PS-2 are trademarks of IBM



First In Value

DIGI-DATA CORPORATION 8580 Dorsey Run Road Jessup, MD 20794-9990 (800) 782-6395 FAX (301) 498-0771

## **Advertise Your Products In The**

## **Classified Marketplace**

#### Featuring

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunities

Reach over 612,000 information systems professionals by placing your company's message in

#### Classified Marketplace.

Name:\_ Company: Address: -

State:\_ Telephone:\_\_\_

Ad Size:

\_columns wide x \_\_\_\_\_ inches deep.

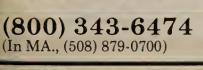
☐ I am enclosing ad material with this form.

Return this form and advertising material to:

#### Computerworld Classified Marketplace

375 Cochituate Road, Box 9171 Framingham, MA 01701-9171

(800) 343-6474





# Sell Us

Copiers

Call:

Tom Ryan at J.J. Bender Assoc., Inc. (203) 331-8073 or (203) 336-4034 or fax info to: (203) 368-4654

# Your Surplus

Copier Supplies
Computer Supplies

Attn: Tom Ryan (CO108)

SPF/PC®

demonstration diskette,

is yours for the asking!

SPF/PC 2.1 brings you the same editing func-

tionality as ISPF/PDF

on the IBM mainframe.

Prove it to yourself.

MicroTech

Conversion

Systems

#### FREE FREE BUYER'S GUIDE

### When you need programmer's

development tools, Program-mer's Connection is your best one-stop source. We are an independent dealer representing more than 400 manufacturers with over 1200 software prod-ucts for IBM personal comput-ers and compatibles including: COBOL compilers and utilities, relational databases, and much more. Call today to receive a FREE comprehensive Buyer's Guide, and find out why Programmer's Connenction is your best connection for software

Programmer's Connection 7249 Whipple Ave NW North Canton, Ohio 44720

Canada

800-336-1166 800-225-1166

#### Corporation 1040 Marina Village Pkwy. Alameda, CA 94501 (415) 521-5900

Command Technology

(800) 648-6700 FAX: (415) 521-0369

#### Classified Marketplace Works

Just ask Chuck Youngblood, President of Mountain Marketing, a Houston, Texas company specializing in buying, selling, and installing the special raised flooring, power sources and climate control equipment for data centers. "In six weeks Computerworld's Classified Marketplace pulled customers I otherwise couldn't have gotten to in six years. No other publiten to in six years. No other publi-cation has delivered the kind of valuable customers Comput-erworld's Classified Marketplace

Or ask any one of the hundreds of companies who successfully sell their products to readers of *Computerworld*'s Classified Market-place, they'll tell you why they advertise in Computerworld Because it works.

For more information,

800/343-6474 (in MA, 508/879-0700)

## Software

Peripherals/Supplies

Take the SCHI

International: 32 • 52-46 1748

COMPUTER SERVICE

## **Business Opportunities**

■ SCSI versions available for Sun

Complete selection of drives to fit

Sparcstation and others

your needs and budget

Solve all of your 9-track tape

800 223-3693, or 415 424-1174

940 Industrial Ave. Palo Alto, CA 94303

problems with a single call:

#### FOR SOFTWARE PUBLISHERS SEEKING EUROPEAN MARKETS

If your firm is a manufacturer or publisher of mainframe software and you believe, as we do, that Europe will be the fastest growing market for computer software in the 1990's, then please talk to us. We have a network of software distribution subsidiaries and affiliates throughout the U.K. and Europe with an established customer base and portfolio of products which we are seeking to expand. Our focus is on IBM and DEC mainframe system software.

Take advantage of this opportunity to reach European markets without the expense of establishing your own operation. Our staff knows E.E.C. local markets, which are different in each country, and we take care of all advertising and marketing expenses, software installation, local technical support and training

For more information, call Bruce Dahly, Executive Vice (T.A.L.K.) at (203) 227-8626 or (201) 359-3111 or write to us at: T.A.L.K., 315 Post Road West, Westport, CT 06880. Our FAX number is (203) 454-3970.

Let's TALK!

# Softwise

Wisdom cannot be learned. You have it or you don't

Softwise Technologies, Inc. 4121 Saltwater Blvd. Tampa, FL 33622

612,00 MIS/DP Professionals see the CLASSIFIED MARKETPLACE each week. Call for advertising information

(800) 343-6474 (In MA., 508-879-0700)

## **WE'RE LOOKING FOR A FEW**

**GOOD PARTNERS!** 

We're Legato Systems, Inc., a leader in network applica-tion software. And we're looking for dealers and technical consultants who want to make good money by selling a hot, much-needed new network administration tool for Sun/UNIX networked environments.

As a Legato dealer, you'll be provided with training, outstanding support and sales referrals from our experienced sales and technical staffs.

For more information, call (415) 329-7891 and ask for Dennis.

Legato Systems, Inc. 260 Sheridan Ave., Palo Alto, CA 94306 (415) 329-7880 FAX (415) 329-8898

123

MAY 14, 1990

# TRAINING

# Newsletters as training tools

They can refresh, update or cajole, but they call for a disciplined approach

BY JESSICA KEYES SPECIAL TO CW

n the world of information systems training, a newsletter can be worth a thousand follow-up training sessions.

IS training organizations usually have only a day or two to teach people how to use a particular piece of software or hardware. During this short period of time, the instructor tries to convey a wealth of knowledge. The problem is that students generally retain only a small percentage of what they hear or read. This fact accounts for the high proportion of students who retake courses, presumably to "refresh" their memories.

Even when trainers successfully drive home principles and students actively use their newfound knowledge, the instructor often finds that there is some follow-up information to impart. There is often a need to update lessons. Instructors can forget to make a point or run out of time before covering all of their mate-

Finally, there is the problem of students who take courses but eventually lose interest in the subject. It's particularly common with topics that generate a lot of attention, such as fourth-generation languages. Students may not find the time to use what they've learned and may need some prodding to do so.

How, then, can IS training organizations perform the following tasks?

- Reinforce classroom training?
- Keep students informed about new features and functions?
- Keep students interested in using the tools they've labored to equip them with?

A newsletter could be the answer. A newsletter can develop a loyal following, whether it is for useful information or simply chatty commentary. Whatever the reason, good newsletters are often read from front to back. To generate this kind of loyal readership, however, a newsletter publisher must follow certain rules. Among them are the fol-

• Publish regularly. If readers are going to take a newsletter seriously, the publisher must demonstrate that he takes them seriously. That means the newsletter arrives on time, all the time. Otherwise, readers won't be able to depend on it, especially for timely announcements.

• Run repeating columns. Regular columns are another



means of building reader loyalty. Covering a topic in a regular place and with a consistent format helps readers find information that is helpful to them. For microcomputer users, columns might include a Lotus macro of the month, a spreadsheet newswatch, word processing tips or new Dbase applications.

Will the newsletter be geared to end users or IS staff members? Will it cover only personal computer training or will it deal with systems built in-house? Too broad a scope will prevent a newsletter from conveying a personal touch. Worse, by trying to satisfy too many readers it can end up satisfying none.

- Keep it short. A big advantage of newsletters is that readers can peruse them during spare moments in almost any situation. They might take in an issue while waiting in line or riding the bus or train.
- Make it interactive. To get readers more involved, newsletters can ask them to respond to surveys. Another interactive approach is asking them to try particular software programs and write back about their experiences. Innovative publishers issue disks containing the text of articles or let readers download macros and other programs.
- Make it fun to read. Manuals are not fun to read. The notes from your latest course are probably not fun to read. But a newsletter can and should be fun to read. It might include contests, cartoons, jokes and other humorous items. Try to imagine a publication that you would enjoy reading — then create it.

• Target a specific audience. • Welcome outside contribu-

tors. Seeing your newsletter become popular enough that managers or readers want to contribute to it is a sign of success. Readers should value these contributions if writers prepare the pieces thoughtfully; people love to know what their peers are doing, and they like hearing it directly from the horse's mouth. A good way to start in this direction is to encourage or even solicit letters to the editor.

A newsletter is the one training vehicle that can go anywhere and be read anytime. It reinforces prior training, provides new ideas and encourages feedback and sharing. It's also something that people can enjoy.

Today, there are many desktop publishing packages on the market that are easy and quick to use. With them, publishers can achieve near-typeset quality for less than \$500.

Even without this specialized software, training organizations can produce great newsletters using word processing. The most important thing is publishing the material your readers want. Who says training has to end when students leave the

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

#### Help Yourself For a Change

The Software Support Professionals Association (SSPA) is presenting a series of courses in customer and technical support at all levels. You can help yourself with subjects including call management, career planning, report-Ing, recrulting, and managing software support...at a profit.

Courses begin in May so get help now.

#### **Quarterly Roundtable**

A one-day software support workshop will be held on June 7th In Los Angeles, CA, offering an opportunity to meet peer managers from different companies and discuss real operational support issues and ideas. This Intense. hands-on session will be hosted by Candle Corporation and includes a tour of the Candle Support Center.

Call 619/745-2271 today to register.

The Software Support Professionals Association

SSPA

11828 Rancho Bernardo Road, Bldg 123-161, San Diego, CA 92128

Instructor-Led Mainframe Training and Development for IBM and related products.

Interact

914-332-6100 (Within NYS)

800-628-5471 (Outside NYS)

Outstanding **DB2** Training

5 Day Hands-On Training at Client Site

Call:

212-752-8525

#### Cut Your Training Costs by 40 to 60%

Example: CICS, CONCEPTS & CODING ON-SITE, 5 Days, Excellent Instructors, Manuals, Coding Guides, Hands-On Labs, Exercises, Dumps, Practical Examples & Much More.....\$ 4,950

We offer 20 IBM & Related Product Courses!

Jeff Markiewicz & Associates

"Data & Communication Specialist"

For Course Information Call (301) 282-8799

#### Successful **Staff Services** Marketing

We train your IS staff to successfully market their services to other departments. Your staff will receive expert IS services marketing and salesmanship training.

- one-day session
- on-site training
- post-session report low price

Call or write for more information:

William McDonald, Ph.D. Winston
Management Services
Parker Plaza
400 Kelby St., Suite 1500
Fort Lee, NJ 07024
(201) 461-2367

COMPUTERWORLDS's TRAINING SECTION Examines the issues while Computer Professionals examine

your message. Call for all the details (800) 343-6474 (in MA., 508/879-0700)



Computerworld's

Training Section

needs only 6 days notice to run your ad!

Call:

(800) 343/6474 (in MA: 508/879-0700)

# **COMPUTERWORLD's**

# May/June

**Training Editorial Topics** 

Training through networking for programmers and analysts

User Review: Portable Computing Ad Close: May 15

Training Plus; Activities to hold before and after training to enhance effectiveness

> Executive Report: Managing the Network Ad Close: May 22

Pros and cons of in-house and outside training

> Executive Report: PCs Forging New Trails Show Distribution: Comdex Spring, Atlanta Ad Close: May 29

#### SALES OFFICES

Publisher/Fritz Landmann

Senior Vice-President/National Sales Director/Kevin Har-old, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

BOSTON: Regional Vice-President - North/David Peterson Sr. District Managers/Bill Cadigan, Shery Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (50B) B79-0700

CHICAGO: Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Lange, COMPUTER-WORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 6001B (70B) 827-4433

NEW YORK: Regional Vice-President - East/Bernie Hockswender, District Managers/Fred LoSapio, Paula D'Amico, Sales Assistants/Susan Kusnic, Patricia DeBiase, COMPUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

LOS ANGELES: Regional Vice-President - West/Jan Harper, Southwestern Regional Manager/Carolyn Knox. Sales Assistant/Bev Raus, COMPUTERWORLD, 1800B Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Regional Vice-President - West/Jan Harper, Senior District Managers/Ernie Chamberlain, Michela O'Connor Abrams, District Manager/Alicla Saribalis, Sales Assistants/Chris Kobayashi, Nunt Zekman, Carol Lacasse COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Regional Vice-President - East/Bemie Hockswender, District Manager/Melissa Christie Neighbors, Sales Assistant/Debra Brown, COMPUTERWORLD, 1400 Lake Heam Drive, Suite 330, Atlanta, GA 30319 (404) 394.0758

DALLAS: Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 232 0892

WASHINGTON, D.C.: Regional Vice-President - East/Bernie Hockswender, District Manager/Paula D'Amico, COM-PUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

CLASSIFIED ADVERTISING SALES:

Classified Advertising Director/John Corrigan, Marketing Director/Derek E. Hulltzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (50B) 879-

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonamgo, 375 Cochituate
Rd., Framingham, MA 01701-9171 (B00) 343-6474, In
MA (508) 879-0700

**West:** Account Executive/Bill Creonte, 375 Cochituate Rd., Framingham, MA 01701-9171 (B00) 343-6474, In MA (50B) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (B00) 343-6474, In MA (50B) B79-0700, Account Executive/Andrew Rowe, (B00) 343-6474, In MA (50B) B79-0700

Mid-Atlantic: Regional Manager/Valerie Galbo, Mack Center 1, 365 West Passalc St., Rochelle Park, NJ 07662 (201) 967-1350, Sr. Account Executive/Jay Novack, (B00) 343-6474

South-Atlantic: Regional Manager/Katie Kress, B304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (B00) 343-

Midwest: Regional Manager/Pat Powers, O'Hare Corp. Twr 1, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 6001B (70B) B27-4433, Account Executive/Ellen Casey (800) 343-6474

West: Regional Manager/Barbara Murphy, 18008 Sky-park Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (800) 343-6474

DIRECT RESPONSE CARDS:

East: Account Manager/Norma Tambumno, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201)

West: Account Executive/Jill Halbert, 1800B Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, COMPUTERWORLD, 375
Cochituate Road, Box 9171, Framingham, MA 017019171 (50B) B79-0700

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

#### CW PUBLISHING/INC.

An International Data Group Company

Fritz Landmann President & Publisher

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 50B-B79-0700, Telex: 95-1153, FAX: 50B-B72-B564

Senior Vice-President Special Publications Division

Senior Vice-President **National Sales Director**  Chief Financial Officer

FINANCE Controller, Mark Sullivan.

SALES Advertising Director, Carolyn Novack. Classified Advertising Director, John Comigan.
Marketing Director, Derek E. Hulitzky. Display Advertising Production Manager, Maureen Hanley. Classified Operations Manager, Cynthia Delany.

MARKETING Vice President/Business Development, Jan Harper. Manager, Marketing Communications, Mary Doyle. Account Manager, Marketing Communications, Elizabeth Phillips. Manager, Trade Show & Conventions, Audrey Shohan. CIRCULATION Director of Circulation Management, Maureen Burke. Director of Circulation Promotion, Carol Spach.

PRODUCTION Vice President/Manufacturing, Leigh Hometh. Director of Publishing Technology, Carol Polack.
Production Manager, Beverly Wolff.

PUBLISHER'S OFFICE Assistant to the President, Karen Eliott. Assistant to the Senior Vice-President, Libby Levinson.

#### GLOBAL LEADERSHIP NETWORK

FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (8AZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung 8ldg, 54 Jaffe Road, Wanchai, Hong Kong, Phone: (011) 852 5 861 3238. FAX: (011) 852 5 86 10953.

AUS1RALIA: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR). FAX: (011) 61 2 439 5512.

AUSTRIA: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A. 1070 Wien, Austria. Phone: (011) 43-22-93-16-31-0. Telex: (847) 115542 (SCH/A) FAX: (011) 43-222-93-05-08-33.

PAX: (011) 43 222 93 03 06 93.

RAZIL: Ney Kruel, Computerworld do Brazil Ltda, Praca Florano, 19/26 Andar, 2031 Rio de Janiero, RJ Brazil. Phone: (011) 55 21 240 8225, Telex: (391) 21 30830 8R. Sao Paulo: Computerworld do Brazil Ltda, Rua Joaquim Florano, 488/3 andar-CEP 04534, Sao Paulo, Brazil, Tel: (011) 55 11 853 8149. Telex: (391) 1132017 (WORD BR). **COLOMBIA:** Rodngo Ruentes, La Nueva Ley, Transv. 428 No. 99 A/66, Apartado 58505, Bogota, D.E. Columbia. Tel: (011) 571 271 5165,

DENMARK: Preben Engell, IDG Danmark A/S, Krujmtappan 4 OK-2500 Valby Denmark. Tel: (011) 45 36 442800. Telex: (855) 31566. FAX: (011) 45 36 442033.

ea: (952) 3190b. FAX: (011) 45 36 442033.
FRANCE: Francois Chaussoniere, IDG Communications S.A., Immeuble La Fayette, 2, Place des Vosges, Cedex 65, 92051 Pans la Defense, France. Tel: (011) 33 1 4904 7900. Telex: (842) 613234F. FAX: (011) 33 1 4904 7800.
HUNCARY: Dezso Futasz, Computerworld Informatika Co., Kft. Pf. 386, 1536 Budapest, Hungary, Phone: (011) 3611 228 458. Telex: (861) 225307 (KSHP H). FAX: (011) 3611

INDIA: Michael Sales, Media Transasia India Ltd., 102 Anand Lok, New Oelhi 110049, India. Tel: (011) 91 11 644 0110. FAX: (011) 91 11 643 2950.

ITALY: Umberto Costamagna, Computer Publishing Group CPG, Via Vida 7, 20127 Milano, Italy. Phone: (011) 39-2-2613432. Telex: (843) 335318. FAX: (011) 39 2 284

JAPAN: Jim Povec, IDG Communications/Japan, Kloicho 18R Bldg., 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan, Tel: (011) 81 3 222 6411. Telex: (781) 252 4217. FAX: (011) 81 3 222 6566.

MEXICO: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Tel: (011) 52 5514 4218 or 6309, Telex: (383) 177 1300 (ACHAME). FAX: (011) 525 511 4860. 

NEW ZEALANO: Martin Taylor, IDG Communications Ltd., 2nd Floor, 15 Augustus Terace, Pamell, Auckland 1, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 774 604.

NORWAY: Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725, Telex: (856) 76476 (CW NOR N). FAX: (011) 47 268 0152.

PEOPLE'S REPUBLIC OF CHINA: Shen Yao, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Tel: (011) 861 81 0044. Telex: (716) 222214 (CCW CN).

SINGAPORE: Asia Computerworld Communications, 04:07 Parkway Builders Centre, No.1 Manne Parade Central, Singapore 1544, Republic of China, Phone: (011) 65 345 8383, Telex; (786) RS 37003 (Comwor), FAX: (011) 65 345 7007.

SOUTH KOREA: Young S. Gimm, Hi Tech Information, Inc. 3rd floor, Youngiae Building, 1600-7 Seocho 3 Dong, Seochogu, Seoul 137-073 Korea. Tel: (011) 82 2 588 8922. FAX: (011) 82 2 582 9823.

SPAIN: Paco Zabala, CW Communications, S.A., Rafael Calvo, 18, 48, 28010 Madnd, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E). FAX: (011) 34 1 419 6104.

SWEDEN: Bengt Marmfeldt, CW Communications A8, Sodra Hammvagen 22, S-115 41 Stockholm, Sweden, Tel: (011) 46 8667 9180. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8665 3132.

SWITZERLAND: Gebhard Osterwalder, CW Publikationen AG, Wittkonerstrasse no. 15, Postfach 253, CH - 8030 Zu-nch, Switzerland. Phone: (011) 41 1 55 10 77. Teiex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

TAIWAN: David Chu, IDG Communications/Taiwan, 4F-2, No. 137, Fu Hsin South Road, Sec. 1 Taipei, Taiwan, Phone: (01) 886 2 776 4553. Telex: (785) 14142 (ACE-GROUP). FAX: (011) 886 2 721 6444. LONDON: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WCI BUT, United Kingdom, Phone: (01); 44 I 831 9252. Telex: (851); 262346. FAX: (011); 44 I 405 2347.

UNITED KINGDOM: Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 78X, United Kingdom, Phone: (011) 44-1-978-1440. FAX: (011) 44-1-978-1550.

VENEZUELA: Kalman von Vajna Nagy, IDG Comunicaciones C.A., Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30. FAX. (011) 58 2 724970.

WEST GERMANY: Eckhard Utpadel, IDG Communications Verlag AG, Rheinstrasse 26/86, Postfach 40 04 29, 8000 Munich 40, West Germany Phone: (011) 49 89 360860. Telex: (851) 5215350. (COMW 0). FAX: (011) 49 89 3 60 86257.

#### ...... INTERNATIONAL DATA GROUP, INC.

Patrick J. McGovern

Walter Boyd

Vice President/Finance

Computerworld is a publication of international Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more international Data Group publishes over 130 computer publications include: ARGENTI-NA'S Computerworld Argentina; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Argentina; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Australia, PC World, Macworld; AUSTRIA'S Computerwelt Desterreich; BRAZIL'S DataNews, PC Mundo; CANADA'S ComputerData; CHILE'S Informatica, Computacion Personal; COLUMBIA'S Computerworld Columbia; DENMARK'S CAD/CAM WORLD, Computerworld Danmark, PC World, Macworld, Unix World; FINLAND'S Mikro PC, Tietovilkko; FRANCE'S Le Monde Informatique, Distributique, InfoPC, Telecoms international; HUNGARY'S Computerworld SZT, Mikrovilag; INDIA'S Computers & Communications; ISRAEL'S People & Computers; ITALY'S Computerworld italia, PC World Italia, JAPAN'S Computers & Communications; ISRAEL'S Propie & Computers, ITALY'S Computerworld; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLAND'S Computerworld Netherlands, PC World Arica; NORWAY'S Computerworld Mexico, PC Journal; THE NETHERLAND'S Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge; PEOPLE'S REPUBLIC OF CHINA China Computerworld, China Computerworld Monthly; POLAND'S Computers; SPAIN'S CIM World, Communicaciones World, Computerworld Espana, PC World Aniga World, SWEDEN'S Computers; SPAIN'S CIM World, Communicaciones World, Computerworld Espana, PC World Aniga World, SWEDEN'S Computers; SPAIN'S CIM World, Communicaciones World, Computerworld, PC Business World, Clotus UK, Macworld Villan, PC World, New Sederal Computer World, Mexico PC World, Network World, PC Games, PC World, Portable Computerworld Talwan, PC World; UNITED KINGDOM'S Graduate Computerworld, PC Business World, Clotus UK, Macworld Villan, Network World, PC Games, PC World, Portable Computerworld Venezueta, Mi

# ADVERTISERS INDEX

A.A.A.I	Lawson Associates       25         Lotus Development Corp       50, 54-55, 58         MCl Corp       60         Micro Focus       39         Microsoft       42         Must Software       29
B I Moyle Associates, Inc31	
Chipcom	National Association of Computer Dealers 69 NCR 44-45, 84-85 Network Systems 63  On-Line Software 46-47 Oracle Corp 9, 11, 13
Data General	Platinum Technology 34-35
Digital Equipment Corp	SAS Institute       19         Software 2000       93         Software AG       15         Sybase, Inc.       36-37         Synapse       98         Syncsort       3
Expoconsul International, Inc 61	Systems Center Software 7
Hewlett-Packard16-17	3Com Corp
IBM Corp	Unlsys
Ingres Corp56-57 Interface Systems12	Walker Interactive
KMW Systems 10	XDB Systems

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

#### Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible. or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

#### Your New Address Goes Here

Company Address City State Zip

Address shown: 

Home Business

#### Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-669-1002



COMPUTERWORLD

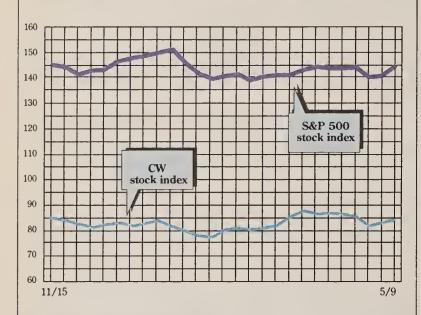
P.O. Box 2043, Marion, Ohio 43305

Address

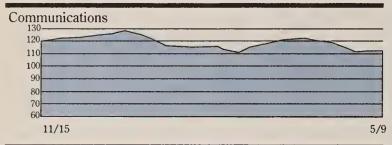
City

CLOSING PRICES WEDNESDAY, MAY 9, 1990

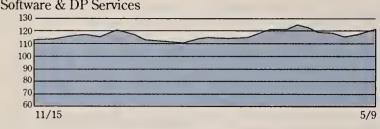
## STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	112.3	112.3
Computer Systems	77.9	80.2
Software & DP Services	117.5	120.6
Semiconductors	55.9	57.8
Peripherals & Subsystems	81.0	83.9
Leasing Companies	89.2	86.8
Composite Index	83.5	84.8
S&P 500 Index	141.0	144.5



Computer Systems	
120	
110	
100	
90	
80	
70	
60	
11/15	5/9
11, 10	0/1
Software & DP Somines	



Semiconductors			
90 ———		 	
80 ————	<del></del>	 ·	
70 ———		 	
60 ———			
50			
40			
30			
11/15			5/9
,			٥,٠

Peripherals & Subsystems	
110-	
100	
90	
80	
70	
60	
50	
40	5/9
11/15	5/9
Lossing Companies	

,		-,-
Leasing Companies	2	
	•	
140		
130		
120		
110		
100		
90		
80		
70		
11/15	CW CHARTS	5/9

# Computerworld Stock Trading Summary

X C H		52-W RAN		CLOSE MAY 9, 1990	WEEK NET CHNGE	WEEK PCT CHNGE	QZQ
	Communications	ano	d Ne	twork S	Servic	es	QQAQA
200202220000000022022020202242202	AMERICAN INFO TECHS CORP ANDREW CORP ARTEL COMM CORP ATTEL COMM CORP ATTEL T AVANTEK INC AYDIN CORP BELL ATLANTIC CORP BELLSOUTH CORP COMPRESSION LABS INC CONTEL CORP DATA SWITCH CORP DIGITAL COMM ASSOC DYNATECH CORP FIBRONICS INTNL INC GANDALF TECHNOLOGIES GENERAL DATACOMM INOS GTE CORP INFOTRON SYS CORP ITT CORP M A COM INC MCI COMMUNICATIONS CORP NETWORK EQUIP TECH INC NETWORK SYS CORP NORTHERN TELECOM LTD NOVELL INC NYNEX CORP PACIFIC TELESIS GROUP PENRIL CORP SCIENTIFIC ATLANTA INC SOUTHWESTERN BELL CORP 3 COM CORP U S WEST INC	68 26 10 47 7 21 57 55 9 15 5 25 21 8 7 7 7 7 22 1 33 65 9 9 49 49 49 49 45 25 25 25 25 25 25 25 25 25 25 25 25 25	55 20 4 34 2 14 45 6 23 2 17 15 4 2 3 50 4 51 3 3 1 7 7 124 7 2 3 8 4 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7	61 23.5 6.25 40.5 3 14.625 49.75 55 11.875 25 2.125 20.75 15 6.875 4.25 52.75 4.25 52.75 4.38.625 10.75 12 24.875 38 82.875 44.25 6.375 22.75 56.125 11.75 36.875	1.0 0.5 0.4 -0.1 -0.4 2.4 1.1 -0.5 -1.0 -0.1 0.5 -0.1 0.5 -0.1 0.5 -0.1 0.0 0.1 0.1 0.5 -0.1 0.5 -0.1 0.0 0.1 0.1 0.5 -0.1 0.5 -0.1 0.5 0.0 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.7 4.4 8.7 0.9 4.0 -2.5 5.0 2.1 4.0 -3.8 -5.6 3.1 1.4 10.3 7.3 7.3 1.4 10.3 7.3 1.4 10.3 3.5 -3.6 -3.5 -3.6 -3.5 -3.6 -3.5 -3.6 -3.6 -3.6 -3.6 -3.6 -3.6 -3.6 -3.6	<220000000000000000000000000000000000
	Compu	iter	Sys	tems			Q

	•						
	ALLIANT COMPUTER SYS ALPHA MICROSYSTEMS ALTOS COMPUTER SYS AMDAHL CORP APPLE COMPUTER INC AST RESHINC BOLT BERANEK & NEWMAN COMPAQ COMPUTER CORP COMMODORE INTNL CONTROL DATA CORP CONVEX COMPUTER CORP CONVEX COMPUTER CORP CAY RESH INC DAISY SYS CORP DATA GEN CORP DATA GEN CORP DIGITAL EQUIP CORP FLOATING POINT SYS INC HARRIS CORP HEWLETT PACKARD CO HONEYWELL INC IBM INFORMATION INTL INC IPL SYS INC MAI BASIC FOUR INC MATSUSHITA ELEC INDL LTD MENTOR GRAPHICS CORP NB INC	8 8 8 8 8 8 95 95 119 166 144 8 184 244 244	4 3 5 11 32 7 4 73 66 162 31 0 8 2 5 70 0 28 40 73 93 12 5 2 123 14 0 0	6.25 3.313 5.625 14.125 41.875 23 4.25 106.125 7.375 18.75 14.875 0.563 9.125 3 9.87.75 132.5 44.875 94.8875 111.25 11.875 11.25 11.875	-0.6 -0.1 -0.8 2.1 1.5 0.9 0.4 0.0 3.8 0.1 0.5 4.0 0.5 6.5 2.1 0.4 0.5 6.5 2.1 0.4 0.9	-9.1 -1.8 -10.6 5.3 7.0 6.7 13.5 2.0 0.0 8.9 12.6 4.3 5.9 4.8 0.0 7.9 1.1 7.4 1.9 3.3 8.6 5.0 3.0	
	MAI 8ASIC FOUR INC MATSUSHITA ELEC INDL LTD MENTOR GRAPHICS CORP	184 24	123 14	2.625 143 23.25	0.1 4.8 0.8	5.0 3.4 3.3	
1	SEQUENT COMPSYS INC SHAREBASE CORP SUN MICROSYSTEM INC SYMBOLICS INC TANDEM COMPUTERS INC TANDY CORP ULTIMATE CORP UNISYS CORP	28 3 28 2 30 49 12 28	11 0 13 0 16 30 5	26.5 0.438 28.375 0.563 25.5 31.75 6	0.0 0.0 3.9 0.1 -0.1 -0.1 0.8 -0.9	0.0 0.0 15.8 12.6 -0.5 -0.4 14.3	
	WANG LASS INC	9	4	4.25	-0.4	-8.1	

## Software & DP Services

)	AMERICAN MGMT SYS INC	16	11	13.75	0.3	1.9
}	AMERICAN SOFTWARE INC	24	14	20.5	1.8	9.3
Ĭ	ANACOMPINC	8	3	3.375	0.4	12.5
)	ANALYSTS INTL CORP	20	13	18.25	0.0	0.0
5	ASHTON TATE	24	9	11.25	0.1	1.1
5	ASK COMPUTER SYS INC	16	7	8.125	0.1	1.6
ì	AUTO DATA PROCESSING	55	38	53.625	1.9	3.6
)	AUTOOESKINC	50	33	47.75	3.0	6.7
Ò	BMCSOFTWAREINC	26	12	23.25	2.3	10.7
ì	BUSINESSLANDINC	14	7	8.75	0.0	0.0
)	COGNOSINC	7	4	7.125	0.6	9.6
i	COMPUTER ASSOC INTL INC	22	11	14.75	1.4	10.3
j	COMPUTER HORIZONS CORP	14	7	12.5	-0.5	-3.8
i	COMPUTER SCIENCES CORP	59	40	44.75	-0.8	-1.6
i	COMPUTER TASK GROUP INC	15	9	10.625	-0.3	-2.3
j	COMSHAREINC	44	28	39.75	-1.8	-4.2
5	CORPORATE SOFTWARE	16	-8	13.625	1.6	13.5
ì	GENERAL MTRS (CLSE)	34	24	33.5	2.9	9.4
)	HOGAN SYS INC	7	4	3.875	-0.1	-3.1
Ò	INFORMIX CORP	17	8	13.25	0.9	7.1
Ò	INTELLICORPINC	7	3	6.125	0.4	6.5
2	LEGENT CORP	32	19	23	-0.5	-2.1
Ò	LOTUS OEV CORP	38	21	32.75	0.3	0.8
)	MICROSOFT CORP	66	26	62.75	4.5	7.7
Ò	NATIONAL DATA CORP	35	22	22.5	-1.3	-5.3
ì	ON LINE SOFTWARE INTL INC	11	-6	7.625	-0.1	-1.6
)	ORACLE SYS CORP	28	13	18.125	2.3	14.2
ì	PANSOPHIC SYS INC	19	10	11.375	0.3	2.2
)	PHOENIX TECHNOLOGIES INC	15	2	2.875	-0.1	-4.2
5	POLICY MGMT SYS CORP	38	28	36.25	2.0	5.8
5	PROGRAMMING & SYS INC	23	16	22	1.0	4.8
)	RELATIONAL TECHING	11	5	7.75	0.0	0.0
ì	REYNOLDS & REYNOLDS CO	34	19	21.125	0.5	2.4
)	SAGE SOFTWARE INC	14	7	13.75	1.0	7.8
)	SELCORP	20	15	19.75	0.0	0.0
)	SHARED MED SYS CORP	19	12	12.375	-0.1	-1.0
)	SOFTWARE PUBG CORP	25	13	22.875	0.6	2.8
)	SUNGARD DATA SYS INC	26	13	18.75	-1.0	-5.1
)	SYSTEMATICS INC	44	30	40.75	-0.1	-0.3
1	SYSTEM CENTER INC	26	17	20.125	1.3	6.6
1	SYS. SOFT INC	29	13	22.25	0.3	1.1
)	WORDSTAR	3	1	1	-0.1	-11.1

#### Semiconductors

N	ADV MICRO DEVICES INC	11	7	9	0.4	4.3	
N	ANALOG DEVICES INC	12	7	7.25	0.4	5.5	
0	ANALOGIC CORP	11	9	9.875	0.1	1.3	
Ò	CHIPS & TECHNOLOGIES INC	26	15	18.75	0.8	4.2	
QQQ	INTEL CORP	44	28	43.25	3.0	7.5	
Ò	MICRON TECHNOLOGY INC	26	7	13.625	0.5	3.8	
Ň	MOTOROLA INC	73	47	72.625	1.1	1.6	
N	NATL SEMICONDUCTOR	9	5	7.25	0.1	1.8	
N	TEXAS INSTRS INC	47	28	35.625	1.1	3.3	
A	WESTERN DIGITAL CORP	13	6	12	0.4	3.2	

#### Peripherals

Q	ALLOY COMP	3	0	0.594	-0.5	-44.1
Ň	AM INTL INC	3 6 6	2 2	2.375	0.1	5.6
0	AUTO TROL TECH CORP	6	2	2.938	0.2	6.8
Q Q	BANCTEC INC	20	11	17.75	0.3	1.4
À	COGNITRONICS CORP	8	3	4.625	0.5	12.1
Q	CONNER PERIPHERALS	22	10	21.25	1.6	8.3
À	DATAPROOUCTS CORP	16	5	9.75	0.0	0.0
Ą	DATARAM CORP	15	8	14.625	0.1	0.9
N	EASTMAN KODAK CO	52	36	38.125	0.3	0.7
N	E M C CORP MASS	7	3	5.875	0.8	14.6
0	EMULEX CORP	11	4	5.375	0.3	4.9
000000000	EVANS & SUTHERLAND	33	17	30.625	-0.9	-2.8
Ò	ICOT CORP	3	1	1.313	-0.1	-4.5
Ŏ.	INTERLEAF INC	3 9 6	5 2	6.375	0.8	13.3
Q	IOMEGA CORP	6	2	3.875	0.0	0.0
Q	LEE DATA CORP	4	1	1.375	-0.1	-8.3
Q	MASSTOR SYS CORP	4	1	1.313	0.1	5.0
Q	MAXTOR CORP	15	7	15.125	2.0	15.2
Q	MICROPOLIS CORP	7	3	5.063	0.2	3.9
V	MINNESOTA MNG & MFG CO	85	68	81.875	2.9	3.6
Ç	PERSONAL COMP PRODUCTS					
	INC	5	4	4.063	-0.2	-4.4
Q	PRINTRONIX INC	12	7	12	0.4	3.2 2.5
V	QMS INC	16	8	15.375	0.4	2.5
Ç	QUANTUM CORP	17	7	16.5	0.8	4.8
V	RECOGNITION EQUIP INC	13	5	5.25	0.1	1.2
Q	REXONINC	9	6	8.75	0.1	1.4
Q	SEAGATE TECHNOLOGY	20	10	12.25	-0.1	-1.0
V	STORAGE TECH CORP	28	9	25.625	-0.4	-1.4
Q	TANDON CORP	2	0	2	-0.1	-5.9
	TEKTRONIX INC	24	13	13.125	0.0	0.0
Q	TELEVIDEO SYS INC	1	0	0.25	0.1	33.0
Ň	XEROX CORP	69	46	48.25	1.5	3.2

#### **Leasing Companies**

AMPLICON INC	17	7	8	-0.8	-8.6
CAPITAL ASSOC INTNL INC	8	3	3.125	-0.4	-10.7
COMOISCO INC	34	17	18	0.0	0.0
CONTINENTAL INFO SYS	1	0	0.25	0.0	-11.0
LDI CORPORATION	18	13	15.5	0.5	3.3
PHOENIX AMERN INC	5	3	3.375	0.0	0.0
SELECTEDMING	à	6	5.7E	0.1	22

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

# Chips ahoy

### Semiconductor makers ride a wave of optimistic numbers

New orders plus new chip equals new stock price high. That's the equation that added up to positive numbers for Motorola, Inc. last week. After reports of brisk April orders and a speedy new chip slated to be introduced today, the semiconductor maker's stock gained 4 points to close at 74% Thursday. Intel Corp. seemed to benefit from the same formula: Its stock advanced 14 points to 431/2, after the firm said its April orders also increased.

Technology stocks apparently lured investors last week, although a few issues did lose ground. Among the good buys was Sun Microsystems, Inc.; heavy trading boosted its price 21/2 points to 281/8. Compaq Computer Corp. jumped 31/4 points to 107. IBM added 1% to 112%, and Hewlett-Packard Co. garnered 11/2 points to end at 461/4. On the downside, Unisys Corp. lost 11/2 points to 13% after news that the leader of its mainframe division, Hollis Caswell, will retire. Digital Equipment Corp. eased ¼ of a point to 87%. Teradata Corp. fell 1% to 25%.

Elsewhere, MCI Communications Corp. announced a dividend payment plan, and its shares edged up ¾ of a point to 38%. AT&T also rang up stock sales this week, up 1/8 to

KIMS. NASH

# **NEWS SHORTS**

#### Unisys reorganizes

Unisys Corp. realigned its computer and networking businesses late last week, combining the two into a single unit called the Computer Systems Product Group. The new division will integrate the products from the former \$1.5 billion Network Computing Group, based in San Jose, Calif., and the \$3 billion Computer Systems Group, based in Blue Bell, Pa. Cyril Yansouni, 47, who had been president of the Network Computing Group, was named president of the new division and executive vicepresident of the corporation. Yansouni was president of Convergent Technologies, Inc. when Unisys acquired it in 1988. The moves came after Hollis Caswell, 58, president of the Computer Systems Group, resigned to become chairman at Hypres, Inc., an Elmsford, N.Y., semiconductor firm.

**EDS** parks in Chicago

Scofflaws in the Loop, beware! Electronic Data Systems Corp. last week received a tentative nod from Chicago city fathers to engineer a parking violations system featuring handheld computers and image processing technologies. Chicago's computerized parking ticket system, with its backlog of hundreds of thousands of overdue tickets, has been plagued by problems that four firms have tried to fix over the years.

#### Livermore looks at paperless world

Is it possible that, in another five years, paperwork will be almost a thing of the past for companies that do business with the U.S. Department of Defense? That's what scientists at the Lawrence Livermore Laboratory in Livermore, Calif., said. They have created a Unix-based software system that can electronically handle nearly all the paperwork that needs to be completed by government contractors. Plans call for the Defense Department to begin pilot testing of the Electronic Commerce Through Electronic Data Interchange program in 1991.

#### Bellcore tests smart card

An experimental "smart" card for telephone users was unveiled last week by Bellcore, the research and development arm of the seven regional Bell holding companies. The card, now in testing with several hundred Bellsouth Corp. and Bell Atlantic Corp. customers in nine states, contains a microchip that can store 50 telephone numbers and can work with some 200 specially adapted public pay telephones in airports and railway stations. Bellcore plans to publish results of the trial later this year.

#### Consortium signs for Tariff 12

American Business Network, a consortium of 66 corporations, will take advantage of the volume discounts for inbound and outbound long-distance service negotiated under a Tariff 12 contract last week between AT&T and EDS, according to M&SD Network Services, Inc. in Lyndhurst, N.J., an EDS subsidiary that is the managing partner of the consortium.

#### NSF stays with just four centers

Thomas A. Weber, director of the National Science Foundation's (NSF) Division of Advanced Scientific Computing, said last week that the NSF has no plan to replace the John von Neumann National Supercomputer Center at Princeton University on the NSF list of supercomputer centers. The Princeton facility, one of five funded largely by the NSF, lost its funding when Control Data Corp. pulled the plug on supercomputer subsidiary ETA Systems, Inc. last year.

#### Charging into outsourcing

Duracell, Inc. outsourced its computer operations to Pittsburgh-based Genix Enterprises in a five-year, \$11 million deal. Bethel, Conn.-based Duracell will eliminate 12 data center operations positions but will keep its own applications development, applications maintenance and management support. Genix will provide mainframe processing, systems software, data storage and data communications.

FROM PAGE 1

President Bush. For example, she said, most consumers do not realize that the surveys at the bottom of warranty-registration cards and data from "frequent shopper" programs are turned into databases for use in highly targeted marketing campaigns [CW, March 5].

Credit bureaus have also hopped on the bandwagon, selling the names and addresses of people with certain financial profiles to companies offering credit cards by mail. Guiton said she is concerned about the practice because information provided for credit purposes is being used for a different purpose without the consumer's knowledge.

The bipartisan complaints are reaching sympathetic legislators at the state and federal levels. Already this year, New York and Maryland have passed laws that prevent merchants from forcing consumers to write telephone numbers and addresses on credit-card slips. (The data was captured for mailing lists.)

Privvy privacy

A 1989 public opinion poll by Cambridge Reports, a polling firm in Cambridge, Mass., found that most Americans are concerned about privacy, and 50% support stronger privacy laws.

"These results make it clear that any business involved even indirectly in handling information on individuals must be very sensitive to people's need to feel their privacy is both respected and protected. In some cases, a company or organization could even use its willingness to protect privacy as an effective way of differentiating itself from

#### Rights for modern times

White House advisor Bonnie Guiton offers five basic guidelines to protecting consumer privacy

- Tell consumers up front and in simple language why certain information is being collected, what it is going to be used for and who will be able to see it
- 2 Collect only information that is relevant to the transaction at
- 3 Allow consumers to opt out of any marketing or other program involving personal information
- 4 Show consumers their records upon request and make it quick and easy for them to correct errors and add explanations
- 5 Make a general concerted effort to educate consumers about how information concerning them is collected and used in today's marketplace

Source: U.S. Office of Consumer Affairs

CW Chart; John York

competitors," the pollster's report said.

Several experts said the privacy issue has flared because of a confluence of factors, including the pervasiveness of telemarketing, junk mail and the controversy over Caller ID telephone services that display the caller's phone number [CW, Feb. 5].

The House Subcommittee on Consumer Affairs and Coinage, chaired by Rep. Richard H. Lehman (D-Calif.), is scheduled to begin marking up a bill next month that makes several proconsumer amendments to the Fair Credit Reporting Act.

Among other things, the bill would prohibit credit bureaus from providing information for marketing campaigns unless the individual consumers are notified and have the option to decline participation.

The industry opposes many of the bill's provisions as too burdensome. "Credit bureaus should be able to sell mailing lists just like magazines and trade associations and country clubs do,"

said Marvin Kaplan, spokesman for Associated Credit Bureaus.

The industry does support tougher enforcement and penalties for those who illegally disclose or obtain personal credit information. Currently, the penalties are so minor — up to one year in jail and a \$5,000 fine that most district attorneys will

not prosecute, industry officials said. The New York-based Direct

Marketing Association, keenly aware of the privacy issue, has a system permitting consumers to remove their names from telemarketing and mailing lists. At the same time, the industry continues to collect more and more information about people and

their buying habits.

branch since the Carter administration to take

such a high-profile role on privacy issues. "It's

one of those welcome surprises. So far, I'd say

Guiton said her philosophy is that, at a time when personal information has become a commodity that is bought and sold for a profit, "we must always be searching for that critical balance between the consumer's need for privacy and industry's need for information.'

# Taking privacy to the public

onnie Guiton, the president's consumer adviser for the past 12 months, has taken the lead role in the Bush administration on privacy issues, making numerous speeches to business and condricks, editor of the "Privacy Times" newslet-

groups and urging Congress to update the 20-yearold Fair Credit Reporting Act.

Guiton's primary message is that the industry needs to do a better job of educating consumers about business databases and develop voluntary industry guidelines to protect consumer privacy. She has also warned the industry that if self-regulation fails, Congress will step in.

In a recent speech, she advised that "there are a bunch of bills out there just waiting for an event or issue big enough to yank them out of the legislative quagmire and give them the attention they need to pass Congress."

Guiton is the first official of the executive

ter in Washington, D.C. Guiton has also gained the respect of industry lobbyists, although they do not agree on every issue. Guiton and her staff have done their homework and made an effort to understand the credit industry, said Steve Fier, director of government relations at Associated Credit Bureaus, a Houston trade association.

However, the industry is more comfortable when Guiton talks about industry soul-searching than when she talks about legislative mandates, Fier added.

Guiton's support for congressional action adds some clout to

the privacy movement, privacy advocates said. MITCH BETTS



Guiton: Industry must educate consumers

# Morris sentence spurs debate

BY MICHAEL ALEXANDER

Attorneys for convicted computer worm programmer Robert T. Morris filed a notice of appeal in federal district court in Syracuse, N.Y., last week amid de-

bate about the adequacy of computer crime laws and whether his sentence was severe enough.

Morris, 25, was convicted in January of releasing a worm program that hampered university and other computers on Internet, a national computer network, in November 1988.

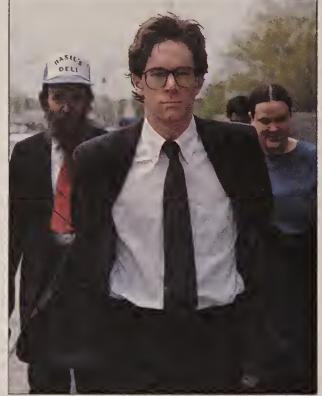
On May 4, the court sentenced Morris to three years of probation, 400 hours of community service and a \$10,000 fine. He was also ordered to pay \$91 per month — the cost of his supervision during probation.

Immediately after sentencing, defense attorneys said that while they believed the sen-

tence was reasonable and fair, they would appeal in an attempt to remove the lifelong stigma of a felony conviction.

Convicted felons are barred from voting, holding certain jobs and getting contracts from the federal government, among other "collateral consequences," defense attorney Thomas Guidoboni said last week.

Some legal experts said the sentence and subsequent appeal will probably spur debate on federal sentencing guidelines as they apply to computer crimes



Bob Mahoney

Morris penalty spotlights statute woes

and renew calls to strengthen the Computer Fraud and Abuse Act of 1986, the act under which Morris was prosecuted.

A mandatory or harsher sentence should have been applied, said David Newman Jr., an attorney and associate professor at

George Washington University in Washington, D.C. "It was too light," he said. The economic damage, which witnesses collectively testified was greater than \$150,000, warranted a jail sentence, he added.

Federal sentencing guidelines

did not apply neatly to this case, a fact noted by U.S. District Judge Howard Munson as well as prosecutors and defense attorneys before the sentencing.

Federal guidelines are based on a system that assigns and subtracts points to circumstances surrounding a crime. Points are added for crimes that require special skills but subtracted if the defendant willingly accepts responsibility.

Federal judges are obliged to follow the guidelines in most instances but can depart from the rules in special cases, which Munson did in the Morris case. The crime did not fit within the guidelines, and there were no anal-

ogous crimes that might have suggested appropriate punishment, he said before sentencing.

Had Munson followed the guidelines, Morris would have faced 21 to 27 months in prison.

"The Morris case also underscores the need to clarify the federal statute," said Joseph Tompkins, partner in the Washington, D.C., law office of Sidley & Austin and chairman of the American Bar Association's Criminal Justice Section's Task Force on Computer Crime.

"The problem is that the law is vague and subject to attack, as in the Morris case," Tompkins said. "You spend a lot of time fighting motions of ambiguity of the law. If the law was clear, a lot of those issues would go away, and you could focus on what the facts are. You have to draw the line somewhere and then decide whether he crossed the line.

Right now, we are trying to put the line somewhere."

A report on the Internet incident to the House Subcommittee on Telecommunications and Finance in June 1989 noted that the computer act does not define such terms as "access," "information" and "prevents authorized use for example." Further, the law is not directed at incidents involving viruses, worms and other crimes involving computers, the report said.

There are at least four pieces of new legislation that would patch some of those loopholes in the law, Tompkins said.

# 'Hacker wanted'

art of the federal sentence handed down May 4 to

Robert T. Morris was that he must perform 400 hours of community service.

Defense attorney Thomas Guidoboni said he hoped Morris would be allowed to apply his computer skills in fulfilling the community service obligation. He said Morris has had several offers for community service work, including one from the chief justice of the West Virginia Supreme Court, who wants Morris to program a computer system that would speed processing of child support claims.

The chief federal probation officer in Albany, N.Y., will determine the nature of community service that Morris is to perform and how that obligation will be carried out, although Morris will probably suggest several alternatives, Guidoboni said.

U.S. District Judge Howard Munson ordered Morris to pay the \$10,000 fine within one year. Morris is consulting with the probation officer on when he must satisfy his community service obligation and when he will be able to seek full-time employment to earn income to pay the fine.

Whether he will have difficulty finding a job in the computer industry is unknown. "I think that a lot of companies would hire [Morris] for his programming skills, but others won't because of the felony conviction or concern that some people would not do business with them for hiring Robert," Guidoboni said.

MICHAEL ALEXANDER

# Secret Service busts alleged crime ring

BY MICHAEL ALEXANDER

PHOENIX — More than 150 special agents of the U.S. Secret Service, teaming with state and local law enforcers, fanned out last week to carry out the largest

crackdown ever on computer hackers.

Working under the name "Operation Sundevil," the law enforcers executed 28 search warrants in New York, Chicago, Los Ange-

les, Phoenix and 10 other cities throughout the country in an effort to break up an alleged crime ring that one official said could account for \$50 million in damages.

The raids produced a haul of 42 computers and more than 23,000 floppy disks as well as telephone testing equipment and computer printouts. Four suspects were arrested, although

two were nabbed for weapons and drug possession charges, not for crimes related to the investigation.

Agents arrested Andrea Gerulis, 19, in Pittsburgh and charged her with theft of services, unauthorized use of a com-

puter and fraudulent use of credit cards, according to the Secret Service.

Anthony Neusall, 20, was arrested in Tucson, Ariz., and charged with fraudulent schemes, pos-

session of an interception device and theft of services, according to Gail Thackery, assistant attorney general for Arizona.

The investigation was launched nearly two years ago following a "colossal wave of complaints" by businesses and other organizations whose information systems had been under repeated attack, Thackery said. Law enforcement officials said

the investigation was aimed at hackers who steal and illegally use long-distance telephone services, voice-mail systems and credit-card numbers.

Authorities set up a sting operation to snare the hackers, Thackery said. She declined to describe how the sting operated or where it was located, but it appears that an electronic bulletin board was part of the plan.

The search warrants were sealed because the investigation is continuing, said Richard Adams, a Secret Service spokesman in Washington, D.C. He declined to provide additional details of the case.

In a press release issued by the U.S. attorney's office in Arizona, however, U.S. Attorney Stephen McNamee said the improper and illegal use of computers may become the white-collar crime of the 1990s.

"This criminal case may account for losses of over \$50 million in 14 cities," U.S. Senator Dennis DeConcini (D-Ariz.) said in a statement related to Operation Sundevil.

Estimates are that computer and credit-card fraud make up a \$5 billion-per-year criminal enterprise, he added.

# New IBM PS/2 misses its mark — by a school yard

BY RICHARD PASTORE CW STAFF

IBM introduced another Personal System/2 Model 25 last week aimed primarily at the education market, but academic computing managers said IBM missed the mark with this particular volley.

The Model 25 286 is based on Intel Corp.'s 80286 chip and ships with an IBM Video Graphics Array color monitor. It offers 512K bytes of memory, a 1.44M-byte floppy disk drive and a 20M- or 30M-byte hard disk drive option. List pricing ranges from \$2,295 to \$2,995.

"It's pretty hard to justify \$3,000 when I can get an Epson 386SX with a 30M-byte hard drive and a decent monitor [discounted] for \$1,500," said Ronald Jones, director of data processing at Paul Smith's College in Paul Smiths, N.Y.

"The price is too high, but I'd

take a long look at it if they gave us a good discount," echoed Edwin Ecker, director of computer facilities at MacMurray College in Jacksonville, Ill.

IBM may have also underestimated the processing needs of larger schools. "It sounds like a nice machine, but it's too low end," said Raymond Geitka, director of computing services at the University of Michigan at Dearborn.

California State University has also standardized on Intel's 80386SX processor. "Since we're buying comparably configured 386SX machines for a comparable price, I think we'll continue to do that," said Paul Tumolo, director of academic computing.

Both Geitka and Tumolo added that the PS/2 might be suitable for home use by students who do not have the money for higher end personal computers.

## **Officevision**

FROM PAGE 1

\$7,000 workstation to send a message?" asked Anthony Mondello, IBM's vice-president of office systems development, in an interview last week. "My view is if someone is reaching a conclusion of completeness based on how much this is better than Profs, well, there's much more than that."

Critics suggested that Office-

vision could win more hearts if IBM were to address some nagging issues.

In short, IBM needs to better accommodate MS-DOS users in Officevision as well as offer support of other environments — most importantly Unix, analysts said. If it does not reach out to

these users, then it will run the risk of watching what was to have been a market-leading office platform become little more than an upgrade for its existing host-based users, observers said.

IBM's Mondello

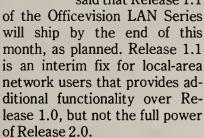
points to future

In addition, IBM needs to deliver on its concept of the Officevision big picture — a userfriendly platform on which office functions and applications are integrated and work together. However, IBM cannot offer more evidence of this until the

appearance of Release 2.0, which has already suffered one delay.

This release, for which general availability is scheduled to begin in the fourth quarter, has both host-version support for OS/2, richer office tools and full application integration capabilities. Observers suggested that IBM push Release 2.0 to market as quickly as possible, or more users may shrug off Officevision as a collection of office tools that they already have.

Mondello last week reiterated his commitment to the new Release 2.0 delivery schedules, which are slated to begin with early releases at the end of this summer and continue into general availability through the first quarter of next year. Furthermore, said that Release 1.1



As for the DOS and Unix issues, Mondello maintained his earlier position that a decision would be made by year's end.

Industry analysts emphasized that of all the Officevision issues, DOS is the most critical. Accord-

ing to Barbara Babcock, vicepresident of office information systems at Gartner Group, Inc., IBM has positioned DOS as a lower functioning, characterbased front end but could change that by supporting the upcoming release of Microsoft Corp.'s Windows 3.0. "It's far more important now to get broad support of Officevision and sacrifice OS/2 for another 12 months," she said.

Secondly, IBM must support other operating environments, specifically Unix, to avoid stamping Officevision as a proprietary solution. "If they had committed to a multivendor environment, it would have been a lot more attractive," said George Conniff, manager of information services at Bechtel Group, Inc. in San Francisco, which has no plans for Officevision. Instead, Bechtel will install a Digital Equipment Corp. Decnet network supporting Open Systems Interconnect specifications.

Finally, IBM cannot fail to meet the revised shipment schedules of Release 2.0. IBM was forced to delay all four Officevision Release 2.0 introductions earlier this year. However, it seemed to suffer little from this, primarily because Officevision has not been sitting on a huge pent-up demand, and as such, it did not leave scores of users in the lurch.

"They can get away with it for now, because no one else is doing anything that compelling," Babcock said.

# Good office days

wo early users of IBM's Officevision gave it a thumbsup last week.

The companies, both IBM host-based sites, are supporting hundreds of users under Officevision Release 1.0, which was installed earlier this year.

"We wanted to get something and integrate [office applications] into one set of menus that the users wouldn't be intimidated by," said Jerry Thompson, vice-president of information systems at Texas Credit Union League and Affiliates in Dallas. "The only thing we could come up with that would serve that need was IBM's product."

Thompson, who is running Officevision under the VM operating system, began hooking host-based applications to Officevision so that users on terminals and personal computers in Officevision can move from one set of functions to another from a single menu. "This has eliminated the need to sign off one and log on to another," Thompson said. "It's made life a lot easier to our non-DP-type community."

He has also integrated Graphical Data Display Manager, an IBM mainframe graphics package that can present statistical and other information in graphical format. In terms of PC presentation, it is a far cry from the full-blown iconic, graphical user interface that OS/2 will bring to future Officevision users, but Thompson said his users are satisfied with it.

United Gas Pipe Line Co. in Houston is another Officevision user that claimed to have a few hundred satisfied users. James McCoy, an IS manager at United, said his selection of Officevision was a case of good timing.

At the time of the Officevision rollout, the MVS shop was looking to move away from three Wang Laboratories, Inc. systems, which handled the office automation functions.

McCoy said Officevision represents a huge cost savings. Since the Wang systems were dedicated to office applications, he considered his previous total office functions cost to be approximately \$1 million. In comparison, the Officevision purchase will cost about \$60,000 to \$70,000 per year. "That wasn't a hard decision for me to make," McCoy said.

ROSEMARY HAMILTON

# Third parties bearing down on SAA

BY SALLY CUSACK

One year later, several of the software companies that heralded IBM's introduction of Officevision seem to be concentrating their energies on delivering their own Systems Application Architecture (SAA) applications

In February, when IBM announced shipment delays for the next release of Officevision, few— if any— eyebrows were raised at Dun and Bradstreet Software. Brian Cohen, vicepresident of technology and research at the Natick, Mass-based company, said D&B is

investigating the possibility of creating a more tightly coupled version of its Millennium SAA package, one that would fully implement the Officevision icon technology, but nothing definite is in the works.

Similar sentiments were echoed by Lotus Development Corp. in Cambridge, Mass. Mike Mitsock, a senior product marketing manager at Lotus, said that while the company is continually monitoring the situation with IBM, current users of Lotus' 1-2-3/G are not suffering at all, as the product coexists nicely with Officevision 1.0.

search at the Natick, Mass.- The delay is basically creating based company, said D&B is minor adjustments in product de-

velopment and marketing plans for the software vendors. According to Fred Braddock, vice-president of research and development at Sterling Software, Inc. in Canoga Park, Calif., the company revamped its original plans for Presentation/Answer, a software application program for moving data from IBM mainframes to desktop computers in an SAA environment.

The package, which runs under OS/2 Extended Edition Database Manager, was going to be released as a companion to Officevision. Now targeted for a mid-1990 launch, the software will debut as a stand-alone program.

# AT&T unveils scaled-down, lower cost net manager

BY ELLIS BOOKER

NEW YORK — AT&T pushed its integrated network management strategy forward last week, offering new features for its Accumaster products for monitoring and controlling AT&T long-distance services and private networks.

However, the best news for users, according to analysts, was the introduction of a scaled-down version of the Accumaster Integrator at half the price of the original graphical workstation-based umbrella management system that AT&T introduced in January.

The Integrator collects and correlates data from various AT&T and non-AT&T element management systems and is the brains behind AT&T's Unified Network Management Architecture (UNMA).

"The main problem with the Integrator has been its entry price; the minimum is \$250,000, with a monthly fee of several thousand," said GiGi Wang, director of datacom research at

The Yankee Group.

At a beginning price of \$180,000, the new Accumaster is limited to a maximum of two Sun Microsystems, Inc. Sparcstations and up to three element management systems. The original high-end system supports 10 workstations and up to 12 element management systems.

AT&T also said it has a promotional offer for the new version whereby users who buy before September get the system for as little as \$110,00. While AT&T declined to state the size of its customer base for the Integrator, analysts said dozens of companies may be using the product today, with many more evaluating the system.

The high-end Integrator was also upgraded in what AT&T called a response to feedback from customers. Release 2, which will be available in the first quarter of next year for an additional \$30,000, adds the ability not only to monitor alarm conditions on a network but also to restore service through automated scripts provided by AT&T or written by the customer.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the

first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1988 by CW Publishing/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: back issues, if available, may be purchased at \$2.00 per issue, plus postage.

Call (800) 669-1002.

Call (800) 669-1002.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem.

fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. For Back issues contact Margaret McIndoe.

Requests for missing issues will be honored only if received within 60 days of issue date.

Subscription rates: \$2.00 a copy: U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface), \$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address.

Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

ADA



ABP



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

MAY 14, 1990 COMPUTERWORLD 129

Time frame for replacement

Of the 670 hospitals that plan to make

major changes, 44% will complete their modifications in less than nine months

## **TRENDS**

# Hospital Systems Market

A recent survey of 2,595 hospitals shows that when it comes to IS, the majority prefer to do it themselves

#### Methods of processing

Of the more than 60% of hospitals that elect to do their processing in-house, 68% are using IBM equipment

Percent of respondents (Base: 2,595)



Source: Hancock Information Group, Inc., Longwood, Fla. CW Chart: Tom Monahan

# Percent of respondents (Base: 670) 1 to 9 months 44% 9 to 18 months 34% 18+ months 7% Don't know 15% **Improvement** Patient-care systems — nursing systems that communicate with ancillary departments are the first improvement hospitals hope to obtain from a new system Percent of respondents (Base: 670) Patient-care system 23% Flexible reporting 19% Outdated system 14% Accounts receivable 13% Third-party logs 10% Response time 7% Integration 5% Accounts payable 5% Database 2%

#### NEXT WEEK

Cost accounting 2%

Information management at fast-growing McCaw Cellular Communications means life in the fast lane for Mark De-Camp (left) and Ken Arneson. Manager's Journal takes a look at their efforts to rewrite core applications in order to remain consistent with McCaw Cellular's decentralized management philosophy.



hy not have one personal computer that you can use every day and then pack up to use on a road trip? Portable computer vendors would like to think that this is possible now, but users are not so sure. Expense, screen size and keyboard functionality are just some of the unresolved issues of portable computers. See Product Spotlight.

# INSIDE LINES

#### No hot air

Word on the super side of the street has it that Minneapolisbased Cray Research will announce the long-rumored aircooled version of its YMP supercomputer today. Industry sources said the new computer will cost about \$2 million.

#### Everything's relative

Codd & Date, purveyors of the Relational Model and its famed 12 rules, is looking for a buyer for the consulting practice and Relational Institute. However, as with the firm's attempt at a Relational Model 2 last year, no one seems to be biting.

#### LAN plans, I

Rumors are getting stronger about disarray at Novell resulting from the proposed merger announced last month between Novell and Lotus. The image of local-area network makers working happily is fading. One industry leader who visited the company's Provo, Utah, headquarters said some high muckamucks appeared to be very uncertain about Novell's plans. The source suggested that managers may be hedging on answers or offering answers that may later prove wrong.

#### LAN plans, II

Meanwhile, farther west, 3Com is taking unspecified actions designed to raise its stock price (not the recent stock buy-back announcement). One manager said last week that the computer networking company is "sitting on tenterhooks" awaiting a hostile takeover bid. The source refused to reveal which companies appear to pose the greatest threat, saying, "I don't want to give anybody any ideas."

#### Don't color them Blue

Amdahl will announce its next generation of mainframes without waiting on IBM's next generation, the so-called Summit, according to company President Joe Zemke. Until its 5990 mainframe debut in 1988, Amdahl had trailed IBM's announcements to make sure the company didn't miss any of IBM's features. This may not mean that the new computer will appear before IBM's Summit, Zemke warned — only that its introduction will not depend on an IBM announcement.

#### Rushing to beat the clock

Windows 3.0 is not all Microsoft has up its sleeve. It will announce a Windows version of its so-far Apple Macintosh-only Powerpoint slide generator on May 18. We hear that Aldus is also moving Persuasion, a competitive product, to Windows.

#### Nothing to serve up

You can forget rumors of an impending release of Omega, Microsoft's Dbase alternative and Windows-based stand-alone database for SQL Server. It is supposed to be fully relational and object-oriented, with its own Basic-based data language. A source told us that the product has suffered design setbacks.

#### Hot links

The hot news at next week's ICA show will mostly concern software-defined networking — that increasingly strategic telecom service that allows users to enjoy private networkstyle management and configuration flexibility at dial-up prices. AT&T is rumored to be finally announcing a data version of its Software Defined Network. Also, U.S. Sprint will be demonstrating its new global Vnet connection — a real boon to users considering that, according to *The Financial Times*, British Telecom has been overcharging by as much as 74% for overseas connections.

National Semiconductor is discovering a new wrinkle in the term "corporate raider." The company's Santa Clara, Calif., headquarters is being overrun by cats. The little beasties also favor restricted areas that can only be entered with a special ID card, so animal handlers need to be escorted in. "It's not something you can just walk into," a company spokesman said. Unless you're a cat: "Then you can just wiggle in." If felines turn you off, call in your news tips to News Editor Pete Bartolik at 800-343-6474, communicate via fax at 508-875-8931 or address MCI Mail COMPUTER-WORLD.



# "If they can send a man to the moon, why can't they make my computers talk to each other?"



# IBM Has Developed An Answer To The Looming Question Of Multivendor Networking.

As if getting people to work together weren't hard enough, you're faced with a somewhat more complex task.

Getting your computers to work together. You see, computers, like people, need reliable connections to obtain, modify and distribute information.

And no other company connects more companies with more computers to more people than IBM.

Beyond physically connecting your computers, we help them to "interoperate" with each other.

This means that now, all your machines from different networks can speak the same language to each other. As a result, people can share all types of information: applications, files, resources, mail, anything. Whether it's across the hall, the country, or the globe.

Which is why we're committed to OSI solutions, to TCP/IP solutions and to SNA solutions: all to meet your open networking requirements for the '90s.

And IBM network management software will also help you better manage everything you've managed to network.

It's all part of IBM's commitment to helping all types of people using all types of computers work more productively together.

No matter how high their aspirations. For more information, call your IBM Marketing Representative.

